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Macworld

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Speed Demon

110MHz Power Mac Sweeps the Field
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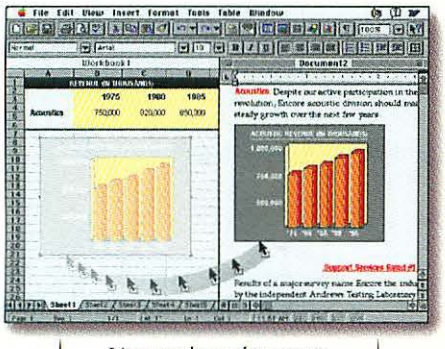

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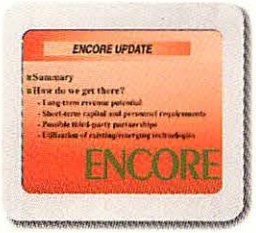

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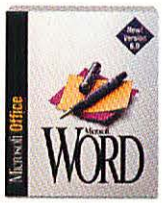

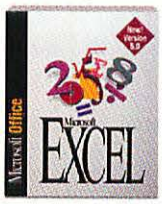

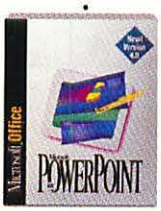

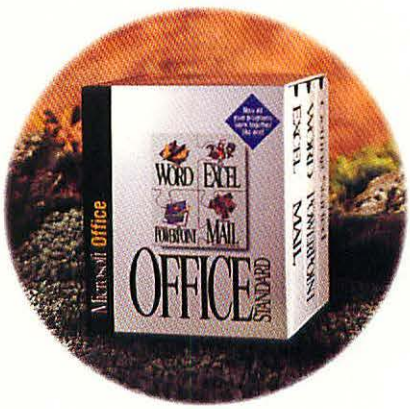

Microsoft Office

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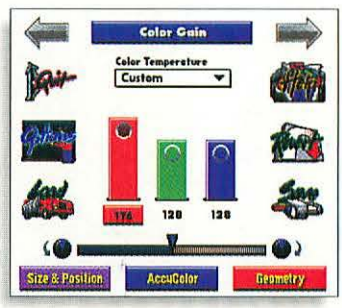

Image Manager software lets you use ACCESS.bus technology to control screen image from your keyboard and mouse.

MonitorManager™ software gives you optimum command of color, plus power management, resolution switching (for Macintosh®), and image control.

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MultiSync XP Series

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ACCESS.bus, Plug and Play.
Digital on-screen controls, AccuColor,®
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Max Res: 1600 x 1200 non-interlaced

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Max Res: 1600 x 1200 non-interlaced

SEE, HEAR AND FEEL THE DIFFERENCE.™

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*When used with Plug and Play compatible hardware and Microsoft Windows™ 4.X.
**Requires use of ACCESS.bus adapter, available separately from NEC, or any ACCESS.bus compatible computer.

Sports car modeled in AutoCAD with AutoSurf. Car and scene (inset) rendered in AutoVision by Yann Bertaud of Autodesk Marketing Support. All images composited in Adobe PhotoShop.

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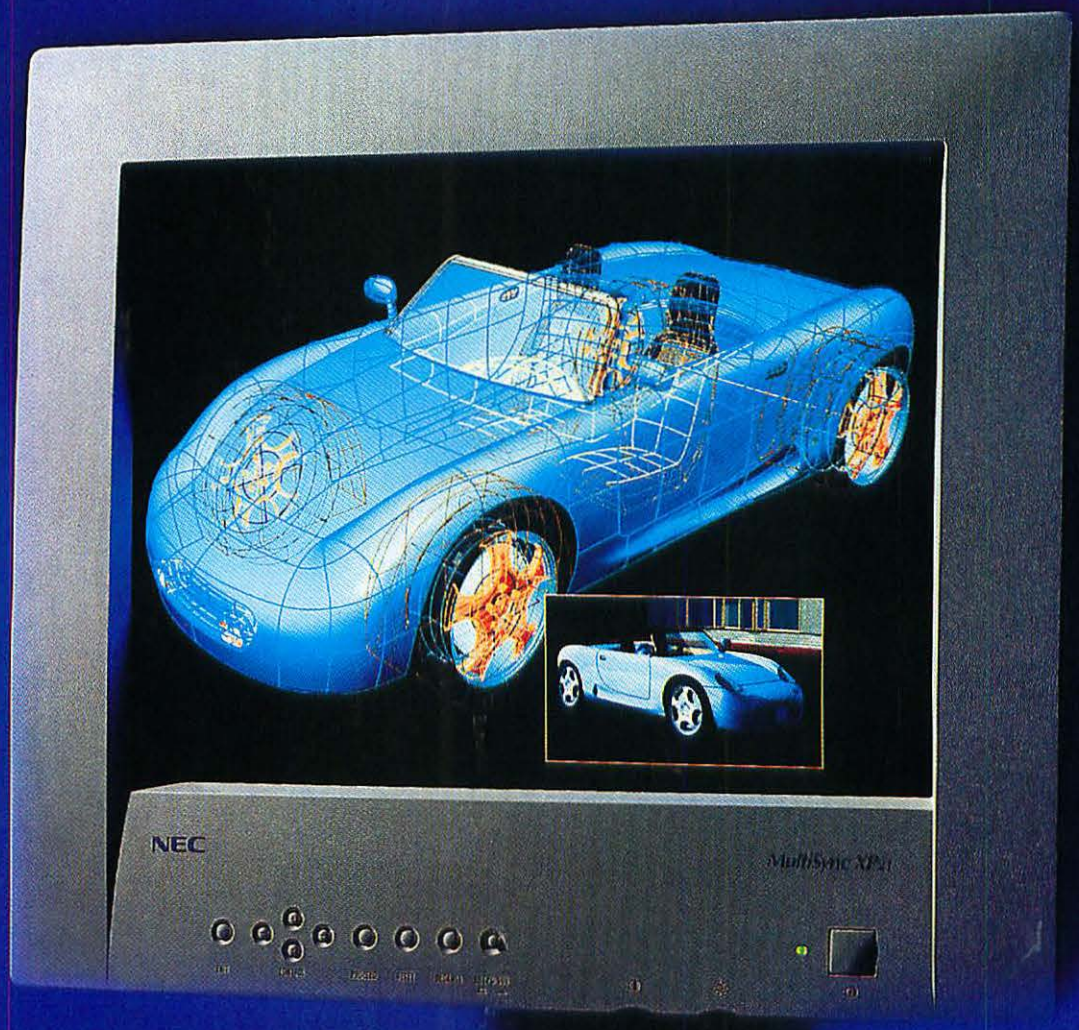
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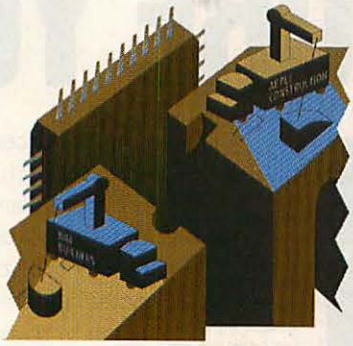

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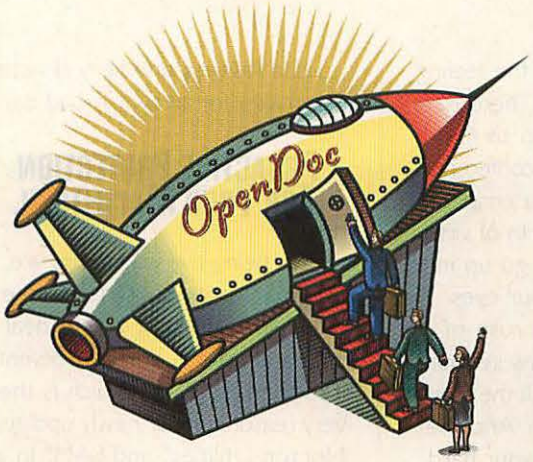

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There is nothing like the feeling of losing your data. There is nothing like booting up to find that your twenty-page conference report has burned to a crisp. Or watching a month's worth of virus-infected spreadsheets go up in smoke right before your eyes.

When it happens, a rush of job-security panic begins in your legs and rapidly bolts all the way up to your cerebellum. And the impact of losing all of your hard work affects you in a way you'll certainly never forget.

Data loss. It's one fiery disaster that makes for an awfully bad day.

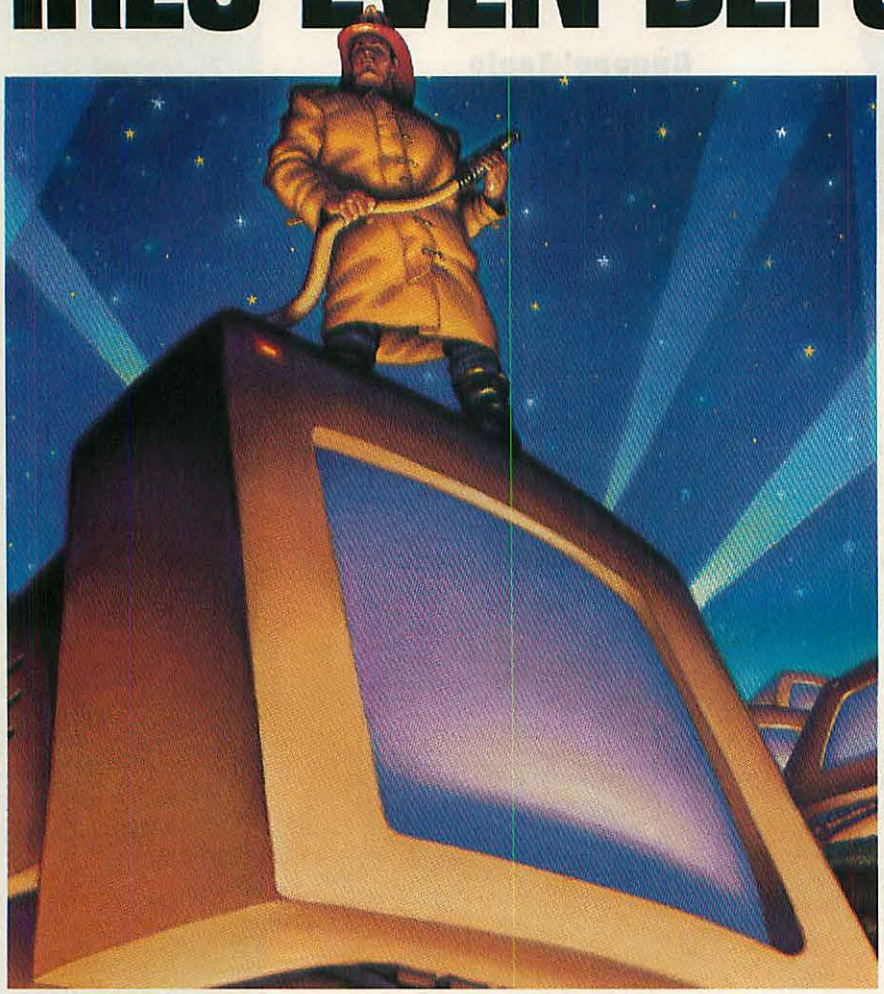
Proactive Protection For Your Macintosh.

This being the way things are, at Symantec we subscribe to the theory that the best way to deal with a disaster is, well, to prevent it in the first place. Which is the very reason for our newly updated Norton Utilities® and SAM.® In a word, they're proactive. But to put it more poetically, this improved data-protection software actually snuffs out fires without so much as the stirring of your mouse.

New Norton Utilities Detects Damage Before Disasters Happen.

For starters, look at our new Norton Utilities 3.1. We've taken the industry's most powerful data recovery and repair program and improved it to where it's almost invisible. So that now you can virtually load it and forget it.

NEW NORTON AND FIRES EVEN BEFORE YOU



The new versions of Norton Utilities and SAM provide proactive protection. Kind of like little firemen running around behind the scenes stamping out fires before they can ever start. So, even if it could've been a ten alarmer, you'll never hear a thing.

The enhanced Filesaver feature proactively and consistently works to maintain your system at premium health by scanning in the background for early signs of trouble. This new agent-oriented technology is a Norton exclusive that personally reminds you when it's time to do basic data maintenance such as backing up or optimizing. In terms you can easily understand. It also automatically monitors your data for up to 500 deleted files so they can be easily recovered.

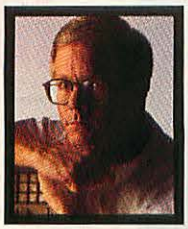
Once a problem has been detected, Norton Disk Doctor takes over. Improved Disk Doctor recommends a solution and then executes it on your command. It now hunts down, diagnoses, and repairs problems in more areas of the disk than any other software.

* Prices may vary. Shipping, handling and tax extra. This offer not good with other promotional offers. Resellers not eligible. Offer expires 12/31/94. Symantec, Norton Utilities and SAM are U.S.

The enhanced Speed Disk's unique customization feature lets you defragment everything from a whole volume to a selected file.

And Norton Utilities 3.1 now also includes enhanced backup. Which creates self-extracting and self-restoring backups of your data.

This improved capability makes it even easier for you to restore data during emergency situations. And our backup now also supports tape drives.



Peter Norton has always been well ahead of the pack when it comes to desktop data recovery and antivirus protection software.

◆ ◆ ◆

greatest level of protection against new viruses as they are discovered.

The new SAM also scans for and destroys viruses in more types of compressed files than any other antivirus software can. SAM covers DiskDoubler, Compact Pro, StuffIt, and Now Compress. This ensures your ability to detect and eliminate a virus in any compressed file.

And for all of you who have a healthy appreciation for speed, the means accelerated scanning speed, greater productivity, along with even more transparent protection.

What it shakes out into is that improved Norton 3.1 and SAM 4.0 now provide your Mac with the ultimate available levels of proactive protection against data loss. It's all rather amazing.

Then again, maybe all of these advancements are not so amazing. After all, Symantec is, of course, the proven industry leader when it comes to Mac data repair and recovery and virus protection.

SAM. THEY PUT OUT CAN SMELL THE SMOKE.

NEW SAM PROVIDES THE BEST PROTECTION AGAINST VIRUSES.

However, that's just the half of this proactive pair. We've also fully redesigned SAM 4.0 to provide the most complete and most effective virus protection, detection, and elimination of known and unknown viruses. So that what could turn your entire system into a towering inferno never even becomes a spark.

Accelerated for Power Macintosh

Norton and SAM are accelerated for Power Mac, letting users take full advantage of the speed capability this technology provides.

One of SAM's exclusive features is automatic virus updating. Through your modem, SAM automatically dials the Symantec BBS daily, weekly, or according to any schedule you tell it to follow.

◆ ◆ ◆

It then downloads the latest virus antidotes and updates your virus definition files. So you now no longer have to mess with manual updating. This assures you have the improved SAM is also the faster SAM. The 4.0 version scans for viruses significantly faster than its predecessor. Which makes virus protection more seamless and less disruptive to your work flow.

Want more? Okay, SAM is also the only virus protection software that allows you to create a custom decontamination disk specific to your machine. This lets you reboot your Mac easily should your system crash from a virus.

The 4.0 version also simplifies the user interface by combining SAM Intercept and Virus Clinic into one easy-to-use component. This advancement allows you to configure more expert options from one convenient location.

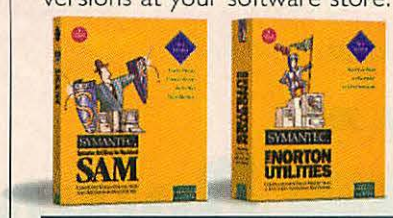
POWER MAC NATIVE.

While these new versions will protect your original Mac, they are also Power Mac native. So those of you with a Power Macintosh can take full advantage of the increased processing power. Ultimately, that

So, pick up the entirely new versions of Norton Utilities and SAM. And then, if you smell something burning at the office, you'll know it's either yesterday's coffee or that guy two cubes upwind who's trying to put out his fiery data disaster. That you well know could have been prevented in the first place.

CALL 1-800-628-4777.

To keep data loss from casting a glow on the office landscape, call 1-800-628-4777, ext. 9FF2. If you own Norton Utilities and SAM, you can order upgrades for $39.95 and $29.95 respectively.* Or you can purchase the new versions at your software store.



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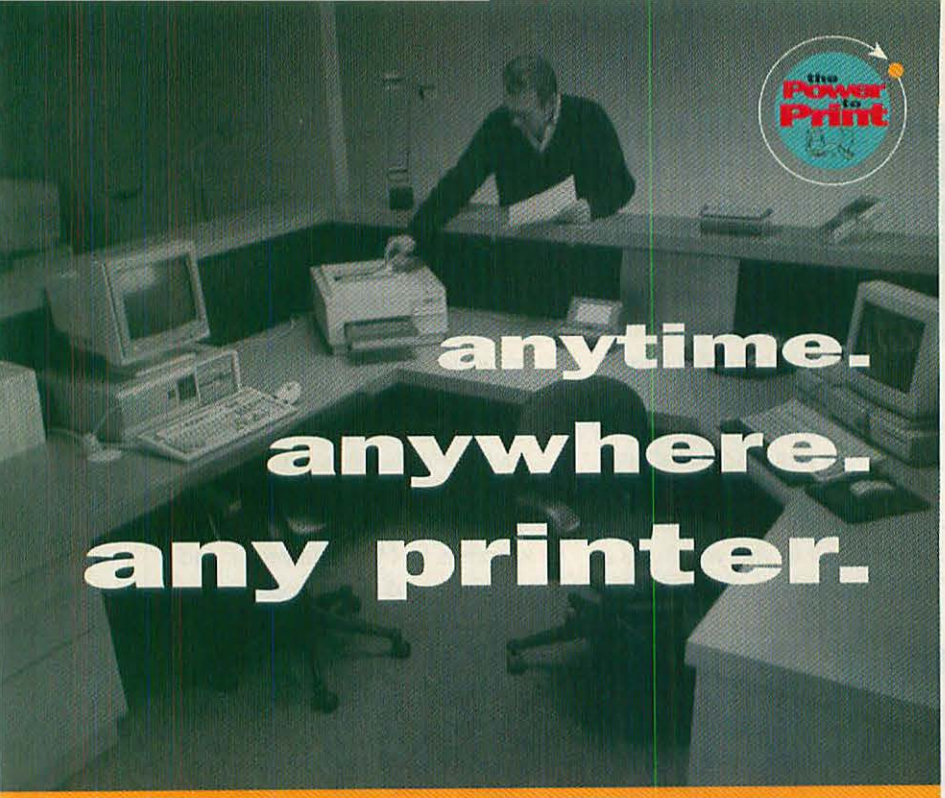

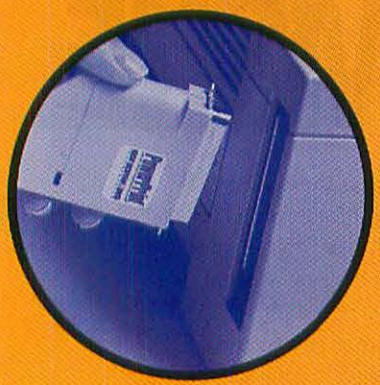

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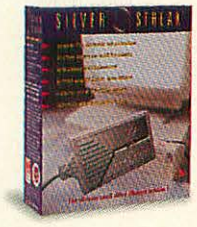

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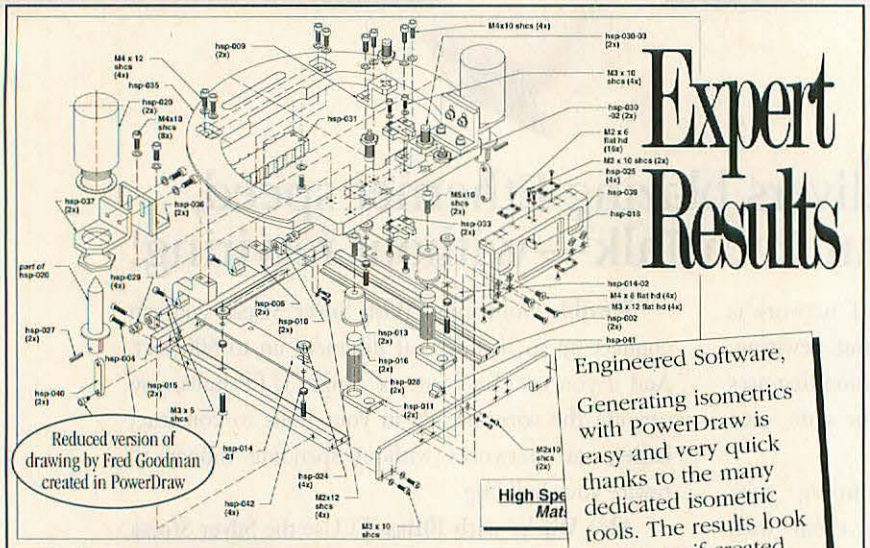

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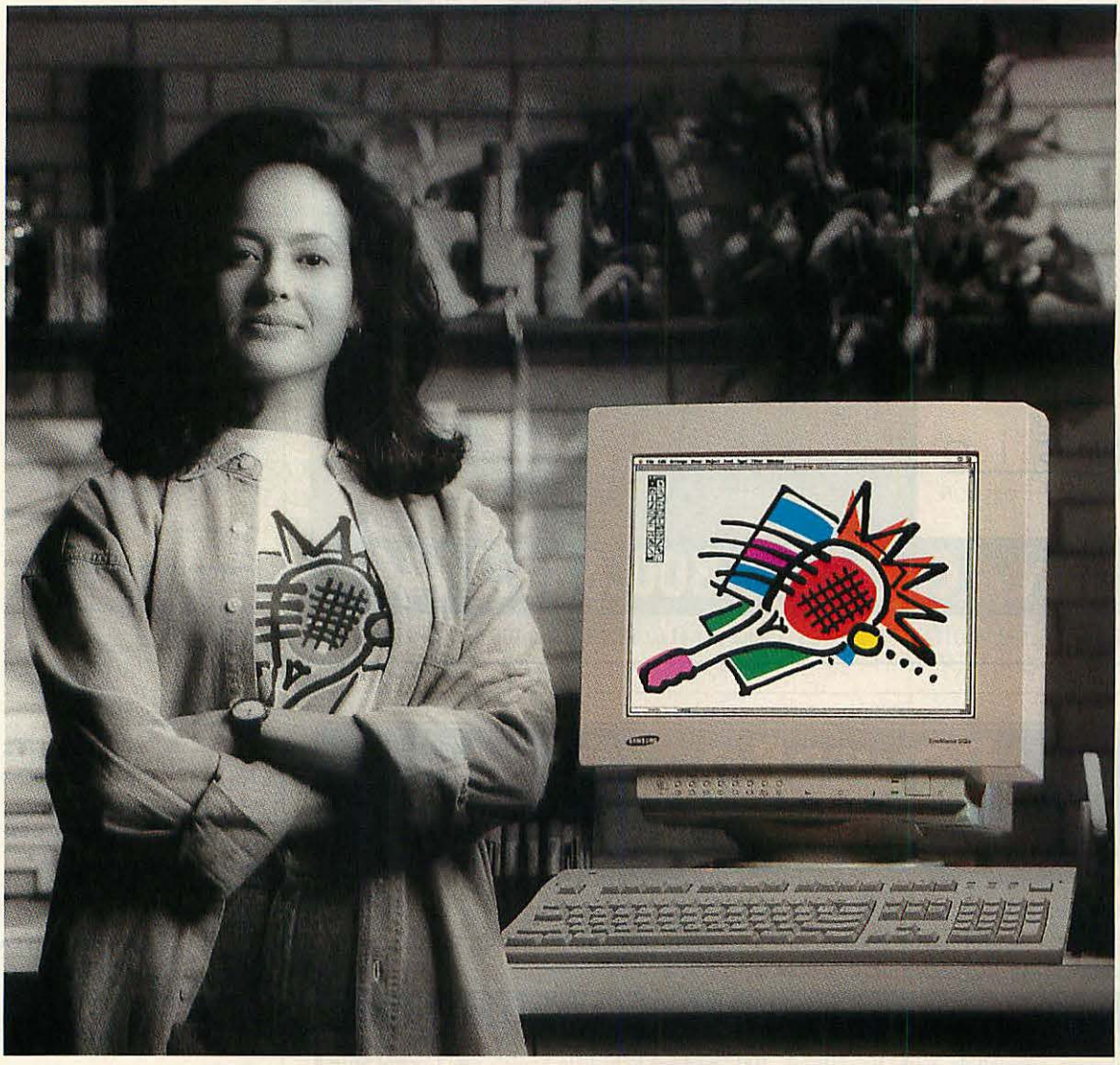

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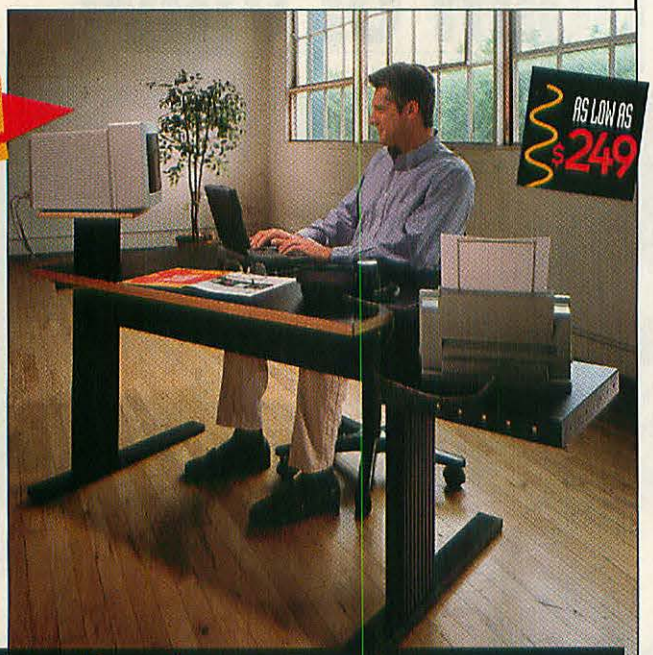

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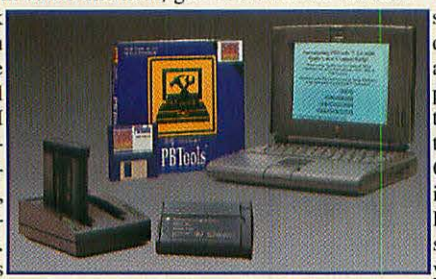

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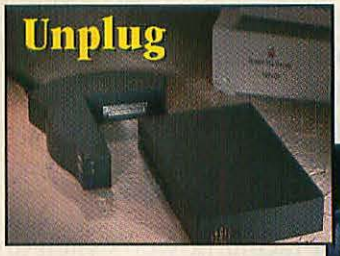

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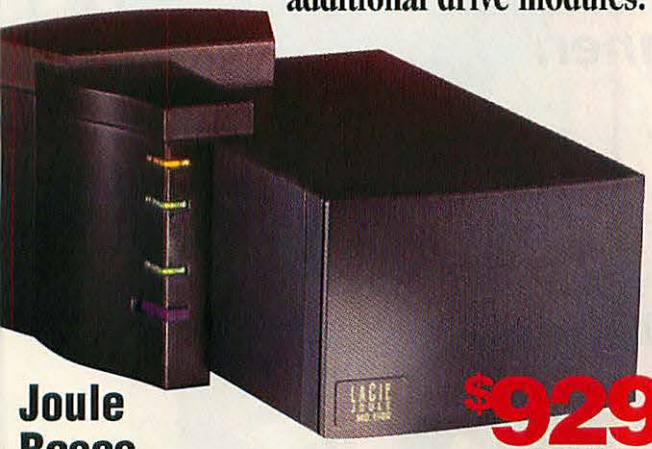

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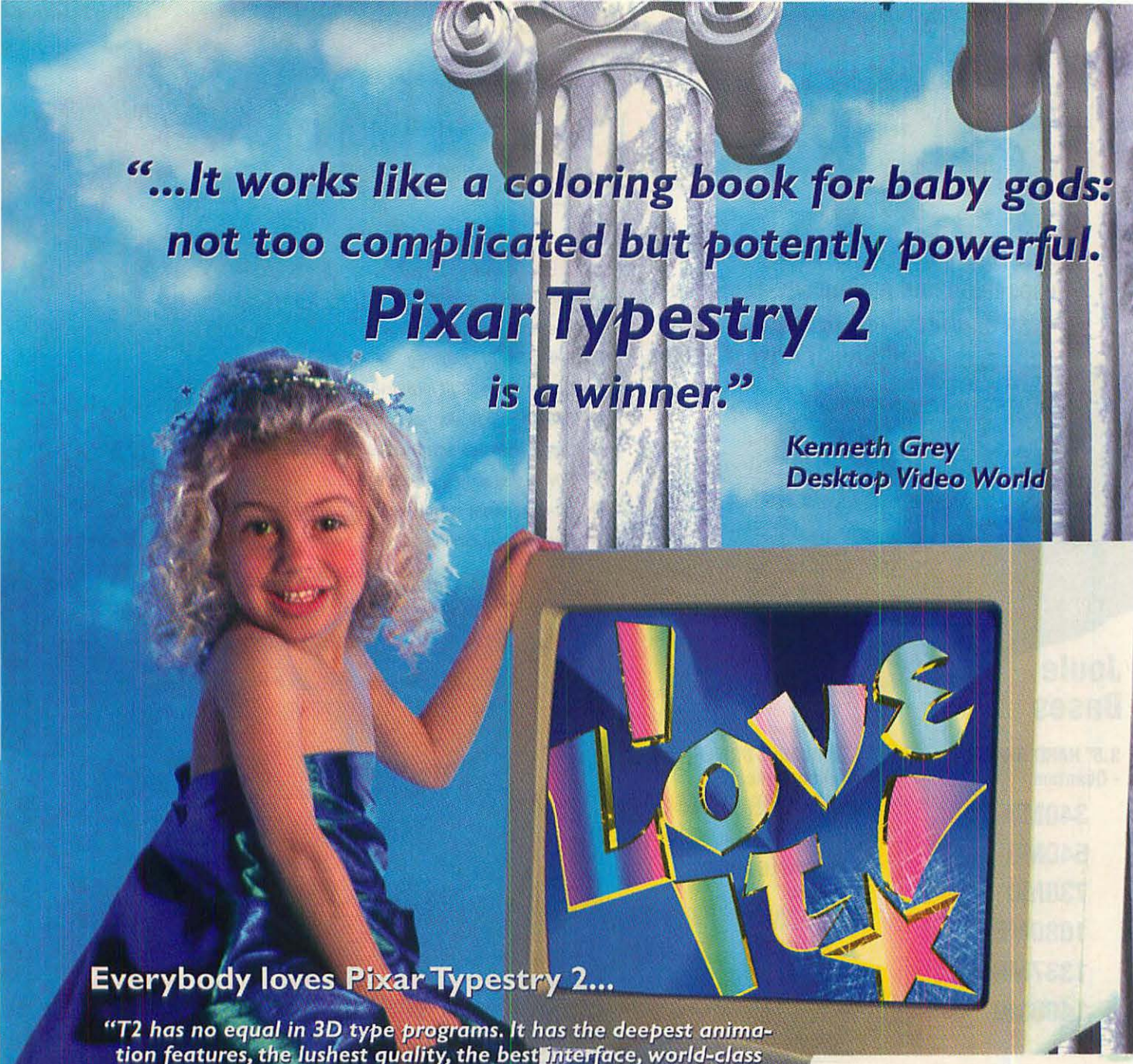

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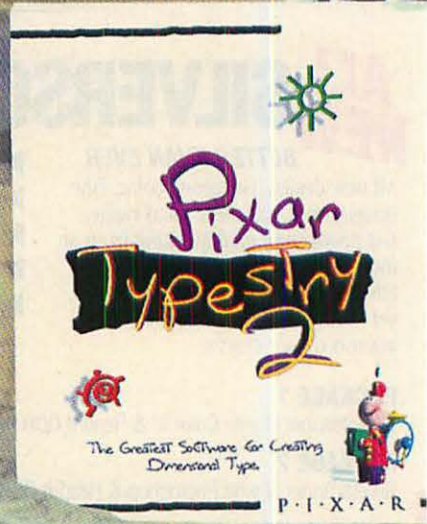

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BY ADRIAN MELLO

The Mac's Eleventh Hour?

Is Apple poised for success?

AS THE NEW YEAR APPROACHES, there are a lot of rumors surrounding Apple. Will Apple be purchased? Who will buy it? Will Apple get a big infusion of cash from IBM, Motorola, or some other company? Who will license the Macintosh Operating System? Does the next version of Windows mean big trouble for the Mac? It's time for a reality check.

Although Apple is doing quite well, in the last couple of years it has suffered some setbacks in market share and developer support. These events, coupled with the success of Windows, have revived doubts about the Mac's long-term prospects. These same doubts resurface every time confidence in Apple dips, despite the fact that the Mac platform has been around for nearly 11 years. Could it be that this is Apple's eleventh hour? But what if instead of heading toward extinction, the Mac is poised for brilliant success?

The Rumor Mill

First let's deal with the rumors. Some of these say Apple will be acquired by a large company such as IBM, Motorola, or AT&T. A more believable rumor is that a company like IBM or Motorola might buy an equity share of Apple, possibly to help pay for new development.

Who knows, maybe I'm wrong and one of these rumors will come true. However, I'll go out on a limb and say that they won't, at least not during this round of the rumor mill. This kind of rumor arises in the presence of three conditions: (1) when Apple's stock appears to be undervalued, (2) when Apple is undergoing a major transition, and (3) when a new version of Microsoft Windows is noisily rumbling toward the market. Every so often, rumors about the imminent purchase of Apple surface, but they have yet to come true.

The simple reason these rumors haven't panned out should be obvious—Apple is a healthy and successful company. Let's start with the financial picture. Apple is much stronger than many analysts have guessed, as demonstrated by its remarkably good fourth-quarter financial results. Sales are up 16 percent, to $2.5 billion, from the same quarter a year ago. Profits for the quarter (which ended on September 30) have increased by more than 40 times, to $115 million. Annual revenues are up 16 percent, to $9.2 billion, and annual profits are up 258 percent. The company has also cut costs while maintaining strong cash reserves. Hardly the profile of a company in trouble.

If Apple's financial strength isn't enough to convince you of its survival, you should ask how Apple is doing with its customers and products. The answer is, extremely well. Not only does Apple have one of the best-recognized brand names worldwide, but its customer loyalty is twice as strong as any other PC vendor's. Many Macs now have price/performance ratios as good as or better than those of comparably equipped PCs. Apple is now much quicker to market with new technology and products than before. Apple has successfully expanded its distribution and also seems to have fewer inventory problems. Overall, Apple is more customer-oriented and provides products that users want, at attractive prices. It continues to field a long stream of hit products, including the Centris/Quadra 605 and 630, new PowerBooks, and the Power Macs, all just in the last year. The company has also responded to customers' demands by opening the Mac platform by supporting solutions that let users run Windows software, and by working with Novell on servers.

I'm not trying to say that Apple has never made a mistake or doesn't face any risks. Apple still has some big challenges ahead. Ultimately, the Mac's longer-term success will depend on Apple's ability to convince more customers and business partners that it is a rock-solid alternative to Windows. To do this Apple must gain market share until it has enough critical mass to vanish any shadows of doubt about its long-term prospects. This will probably occur at about 20 to 25 percent market share—an ambitious goal that is probably about five years away. For now, Apple can provide a boost of confidence by making a noticeable gain in share. That will inspire developers to provide the innovation the Mac needs to distinguish itself as an alternative.

Fear of Windows

As always, each new version of Windows brings the millennial fear of the Mac's extinction. (With computers, the millennium happens every two years.) It's hard to know what to call the next version of Windows. Until summer it was called Chicago, then briefly Windows 4.0. When it became clear that Chicago would fail to meet its ardently promised ship date, Microsoft exercised the fine art of marketing euphemism: the company proudly heralded its failure by relabeling the product Windows 95. Microsoft now promises that it will arrive in mid-1995. Does this mean Microsoft is already anticipating the need for an upgrade—perhaps Windows 96?—six months after it asks users to shell out for the marvelous new system?

Whatever it is called, this next version of Windows is a clear improvement over

continues

GLENN MITSUI/STUDIO MD

the last, with a number of features that should really benefit PC users' computing. However, the new Windows is no more serious a threat to the Mac than were previous versions of Windows. Informally polled Macintosh users still perceive it as clunky; it's likely they will continue to buy Macs. In any case, Apple is not standing still. It will introduce a major operating-system revision (code-named Copland) in late 1995, maybe early 1996. By the time most PC users are ready to upgrade to Windows 95, Mac people will have their own new operating system.

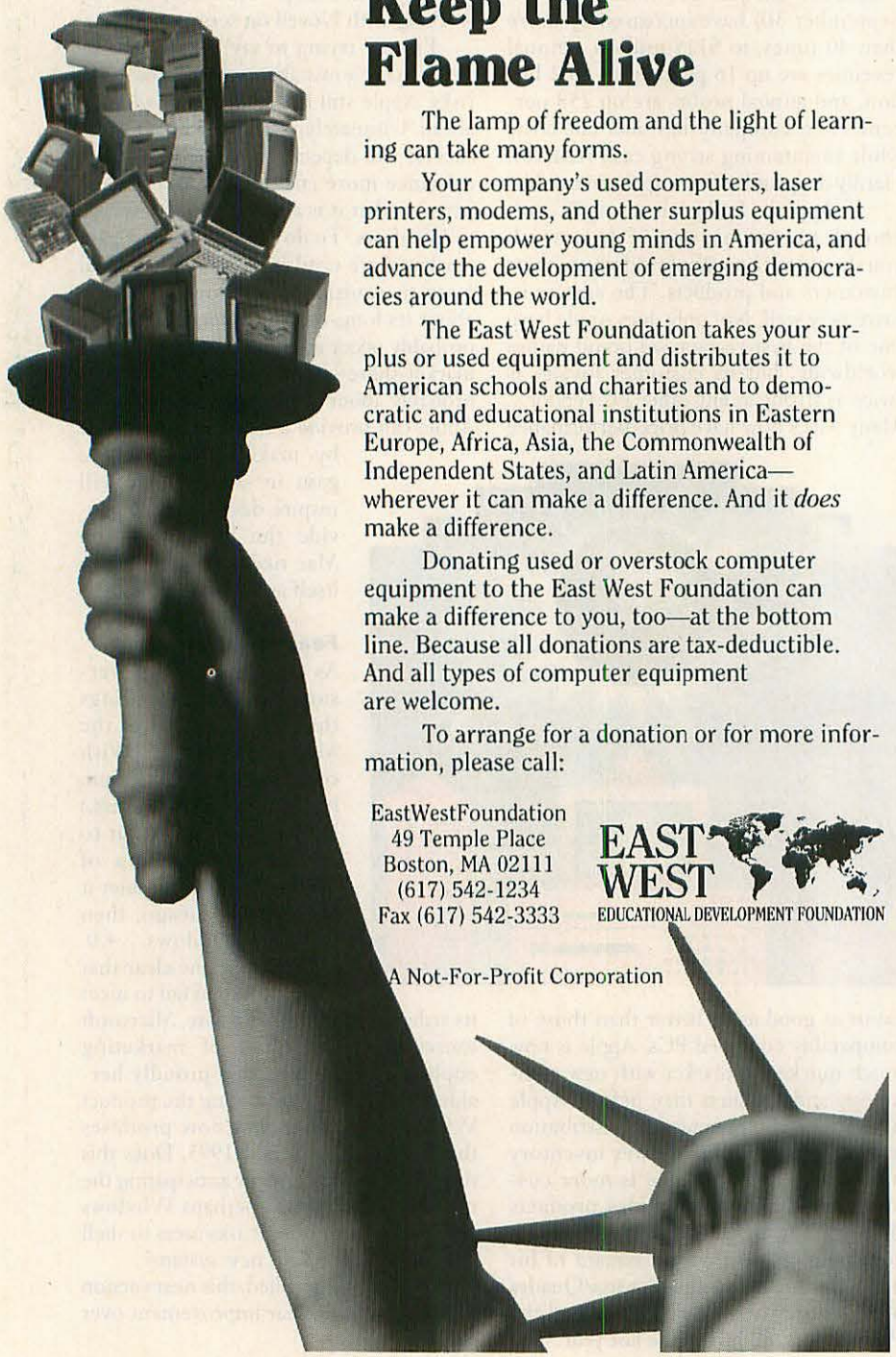
Beyond this, Windows and Intel seem likely to run into problems porting the OS and hardware to RISC in the next few years. In the end, developers will determine which platform wins the innovative applications. They are likely to develop for whatever platform provides them with the best opportunity. If the Mac market starts growing more quickly, developers may find it an appealing alternative to the Windows market's brutal price competition, software suites, and consolidation of companies.

Licensing and Clones

Licensing is the key issue in the growth of the Mac platform. Not only is the PowerPC's market share growing through licensing to other vendors such as Toshiba, but also Apple has now clearly announced its plans to license the Macintosh OS. (See "Spindler Says Clones on the Way," *News*, November 1994.) Apple has said there will be two to three licensees announced by the end of 1994 and a total of five or six announced by mid-1995. Apparently, these agreements don't restrict clone vendors to specific channels, markets, or countries, so Apple seems to have made the necessary shift to allow direct competition. On November 7, Apple, IBM, and Motorola announced an agreement to work toward a shared platform with greater potential for success than the now irrelevant PReP standard originally promulgated solely by IBM. (See "IBM, Apple Move to Joint Platform," *Power Mac News*, in this issue.) This will boost the perception of the staying power of the PowerPC platform and the potential reach of the Mac OS.

Licensing is the fuel that Apple will use to accelerate its growth in market share. Apple now holds about 10 percent worldwide market share. It plans to increase that figure by another 3 percentage points through Apple-branded hardware in the next three years as a likely result of quick product introductions, customer focus, and the aggressive price/performance of PowerPC-based machines. Apple forecasts another 3 to 4 percent of market-share growth through clones. This would mean a 70 percent improvement over three years, for a total market share of 17 percent. This would put Apple in a much less assailable situation.

Apple's prudent approach to licensing should improve growth without losing control of the platform's development. Once the Mac commands a larger market share, Apple will be in a better position to encourage innovation. (For an opposing viewpoint, see *The Iconoclast*, in this issue.) When you take a close look, Apple has corrected most of the Mac's limitations and is taking steps to increase its strength in the market. I believe the Mac market will experience the same kind of success that it did during the two-year period when the Mac Plus and Mac II catapulted the Mac platform into the mainstream. There's one downside, however: we will have to find something else to do other than listen for rumors while watching Apple walk a tightrope. m



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EMPLOYEE EVALUATION

NAME: Chris Wolfe **DATE PREPARED:** 9-8-94

TITLE: Product Manager

DEPARTMENT: Account Management

OVERALL PERFORMANCE:

☒ **Outstanding** ☐ **Commendable** ☐ **Satisfactory** ☐ **Needs Improvement**

COMMENTS:

Chris has become an indispensable member of the account team. He has demonstrated a high level of motivation and enthusiasm for the job. Perhaps the most compelling evidence of this can be found in his ability to work independently, where he picks up new tasks easily with little need for supervision or instruction. He consistently recognizes and works around obstacles to maintain productivity. Consequently, he often completes assignments ahead of schedule. At a time when collaboration is more critical than ever, Chris has also proven to be an excellent team player. He works effectively with coworkers on projects where teamwork is essential, and can easily motivate and inspire others to achieve. When delegating tasks, his thoughts are well organized and his ideas clearly articulated – an indication of his excellent communication skills. His projects are all distinguished by an attention to detail. His conclusions are always sound and logical. And he excels in time management, effectively compiling and analyzing information. He always manages to work efficiently, setting an example for effort throughout the company. Promotion and appropriate compensation are recommended at this time.

Chris Wolfe — **Employee's Signature**

J Bloom — **Evaluator's Signature**

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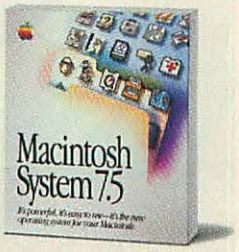

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JANUARY 1995

Letters

Graphics Card Combat

WE FEEL THAT THE OPINIONS RENdered in *Macworld*'s roundup of five 24-bit accelerated graphics cards are inconsistent with the test results, and that a reevaluation of the star rating for the Mirror Tornado 24-bit graphics accelerator board is warranted (*Reviews*, October 1994).

According to your real-world performance testing, the Mirror Tornado board performed "slower than the competition at some tasks and equally fast at others." According to the accompanying chart (on page 59), each of the five boards tested would qualify for this statement in at least one of the areas measured. *Macworld* has traditionally considered the price/performance ratio as an important factor when evaluating hardware. In fact, your "highest recommendation" card earns such an accolade in part due to its "relatively modest price." How can you consider this board's price, which is more than twice that of the Tornado board, to be "relatively modest"?

Your author noted a Power Mac incompatibility concerning bit-depth settings. Tornado's inability to maintain bit-depth settings is caused only by the Monitors control panel version 7.1.2. Users experiencing this problem are advised to upgrade to version 7.3.2 or later of the Monitors control panel to correct the incompatibility.

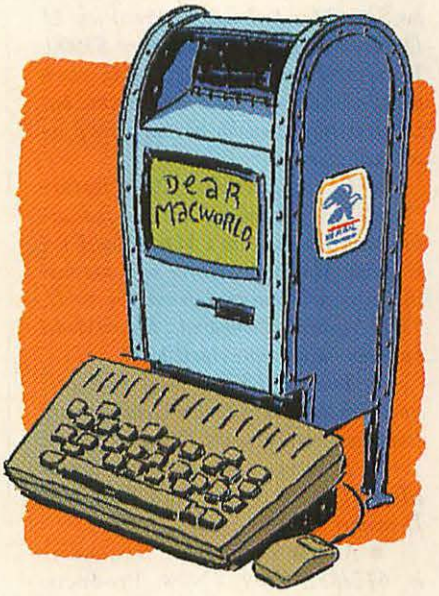
Finally, the Tornado card and only one other card tested have available DSP upgrades. While we understand that DSP was not to be an integral part of the review, it seems neglectful not to at least mention its availability.

Michael Wachholz
Marketing Manager, Mirror Technologies
Edina, Minnesota

Although the Mirror Tornado board was slightly slower in the graphics tests—ranking either last or second to last by a relatively small margin—it was nearly three times slower than the fastest board in our tests of business applications, such as Microsoft Word and Excel, running on 680X0 machines (as published in "Video-Performance Index" in the table "24-Bit Cards: How Fast Are They?"). The bit-depth problem arose when using the board with the Monitors control panel 7.1.3, the version that shipped with Power Macs at the time. In conversations with Mirror during our testing, the company never mentioned the Monitors control panel fix. Despite the newness of the Power Macs, the Tornado was the only board that failed this test.

The highly rated SuperMac board to which you refer retails for $1399. However, since SuperMac sells its products through normal resale channels, the street price is several hundred dollars less. Mirror sells its products direct, so the street price is $699.

The boards we tested made by Mirror, SuperMac, RasterOps, and Radius (not shipping at the time of the review) all have DSP upgrade options, but that fact would not have altered our conclusions, as a DSP chip would have had no effect on the tests performed.—Ed.



WARD SCHUMAKER

IN YOUR RECENT REVIEW "FIVE GRAPHics Cards," Deke McClelland tested the cards' relative performance in real-world usage. Because the installed base of Adobe Photoshop users is significantly large, I was perplexed that this application was not included in your test suite. Photoshop is well known as being one of the single most important applications for graphics professionals.

Dee Craven
Vice President of Marketing, Radius
San Jose, California

Macworld Lab did not include Photoshop in our benchmark table because it would have been redundant—the suite of applications that we tested covers the range of functions that graphics accelerators speed up. Spot tests of graphic accelerators with Photoshop confirm this.—Ed.

Bloated versus Feature-Rich

REGARDING JIM HEID'S PREVIEW of Word 6 in the September 1994 issue (*Working Smart*), as my office's longtime unofficial Word (3, 4, and 5) expert I would be happy if Microsoft would just slow down. There is such a thing as too many choices. When our office moved up to Word 5, I spent as much time explaining new features (to coworkers who had no need for them) as I did playing Maelstrom, and that's a lot of time. After a couple of years, most of us still have no use for many of the fancy functions of Word 5. Is there a Law of Diminishing Neat-Stuff Returns? OK, I'll take The Spike. Can I buy just that part?

Frank Lang
Pasadena, California

MAYBE YOUR MAGAZINE'S NAME should be changed to *MacWord*. For how many more years will readers have to contend with massive editorial genuflection toward that inelegantly named Goliath of a word processor, Microsoft Word?

Many of the features that Jim Heid played up in his preview are already available in WordPerfect, including drag and drop, toll-free technical support, tool bars, and native Power Mac code. If that isn't enough to convince *Macworld*, then

continues

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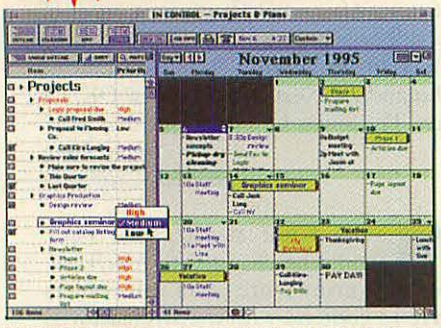

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CORRECTIONS

- *Contrary to the November 1994* Quick Tips *item "Modems on Digital Phone Lines," a telephone-handset jack is not digital; it is always analog. As stated, you can use an adapter such as Global Village Communication's GlobalSwitch to connect a modem to the phone line at the handset jack even if the line at the wall jack is digital.*
- *In "Big Screen Close-up" (November 1994), the street price of $2400 for SuperMac Technology's PressView 21 Display System should have been $3000. We printed a street price of $2400, which one vendor did offer for a limited time, but it was hardly available at that price from a dozen sources.*
- *In the December 1994 feature "Inside 3-D Modeling," the icon indicating that Macromedia's MacroModel 1.5 is Power Macintosh–native software was inadvertently omitted from the table, "3-D Modelers Compared." MacroModel has been native since April 1994.*
- *The "PCI Power Mac Preview" story was written by Galen Gruman with Cameron Crotty* (News, *December 1994).*
- *The correct price for Pasco Scientific's Mac65 is $697* (New Products, *December 1994).*
- *Mirror Technologies' fax number is 612/832-5709* (New Products, *November 1994).*
- *The correct name for John Schlack's fractal shareware program is Color Fractal Generator* (Power Mac News, *November 1994).*
- *Use 800/304-5414 to inquire about The AVO Company's PowerDoor* (New Products, *December 1994).*

maybe you should remind yourselves of exactly which company foisted Windows on the world. Maybe then you can reevaluate your editorial devotion to a bloated, sluggish, word processing dinosaur.

Joe Clark
Toronto, Ontario, Canada

Next Up: MacReceptionist?

IN AUGUST 1994'S *WORKING SMART* column, Jim Heid says that "it's impractical and expensive to dedicate a Mac as a simple answering machine or telephone." High Tide Software's products turn even a Mac SE into a virtual telephone receptionist with unlimited nested mailboxes, pager forwarding, message forwarding, automatic fax receive, and optional fax on demand. Even if a brand-new Macintosh had to be purchased to run the system, many businesses would save the equivalent cost in employee expenses in a single month.

Josh Maddox
High Tide Software
Berkeley, California

Working Smart provides a monthly overview of issues in a given productivity-enhancing area of computing. *Macworld* intends no slight to High Tide or other relevant companies that are not covered—it is not the purpose of *Working Smart* to cover every product, nor, due to space constraints, would it be possible.—Ed.

A Model of Business

TWO ERRORS MARRED CHARLES SEITER's October 1994 review of our business-process modeling package, Extend+BPR 3.0.

Mr. Seiter stated that the need to gather business data is an obstacle to the effective use of Extend. These factors are not requirements for using Extend, they are requirements of the reengineering process itself. Would gathering data for a research project be considered an obstacle to using Microsoft Word?

The second error is even more pronounced. The review implied twice that users must be familiar with C or Pascal and understand data structures to use Extend+BPR. This is simply not true. None of the models in the BPR manual use programming.

Bob Diamond
President, Imagine That
San Jose, California

For a research project in Microsoft Word, our readers know they'll have to do lots of data collection; in contrast, most people don't know that the act of buying Extend+BPR represents about 2 percent of the total business-modeling process.

It's true that Extend users don't have to know how to program specifically in C or Pascal, but if you are unfamiliar with IF/ELSE statements (typically encountered in programming practice of some sort), you'll use Extend at a much lower and less useful level.—Charles Seiter

Serving Up ARA

I CAN'T BELIEVE THAT YOU DIDN'T USE 28.8-Kbps modems in your tests of ARA servers ("Remote Access Arrives," October 1994). If you had, you would have noticed that most, if not all, of the ARA servers have a maximum throughput of 56 Kbps per port. You may not think this is a problem, since 28.8 Kbps is less

continues

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than 56 Kbps, but you've forgotten data compression by the modem.

With data compression, a 14.4-Kbps modem can achieve a maximum theoretical throughput of 57.6 Kbps; a 28.8-Kbps modem can, theoretically, achieve throughput of up to 230 Kbps. But that throughput is wasted if the port on the ARA server can only handle 56 Kbps.

Jay Harper
Brooklyn, New York

It's true that most ARA server ports are limited to 57.6 Kbps, but that's because, currently, the Macintosh's serial port also tops out at 57.6 Kbps. No matter how fast the modem, a remote Macintosh can't send data faster than 57.6 Kbps through a modem connected to its serial port.

Also, modem-compression statistics are usually irrelevant when dealing with ARA, as the ARA modem scripts generally turn off hardware-based data compression and verification. The ARA software handles compression and error correction internally, and produces a far more stable data stream than a modem could.—Ed.

Dreaming of the Net

I'M NOT CURRENTLY A NET USER—I'M more taken by the cyberpunk mythology of the infobahn than really tempted to log on. But like your poll respondents, I strongly believe the greatest potential value of this technology is easy two-way communications between citizens, knowledge centers, and government ("DreamNet," October 1994). Configuring the net as a souped-up pay-per-view venue would be a tremendous waste and will surely fail in the short run. Interactive video networks will have to capture 35 percent of the current video market and charge $40 to $55 per month to turn a profit? Not bloody likely. Unemployment may be down, but so are buying power, benefits, vacation time, and public services. So while we're all working away like busy little bees, it takes more of our income to cover life's necessities. Expensive, high-tech television does not qualify.

Geoff Briggs
Seattle, Washington

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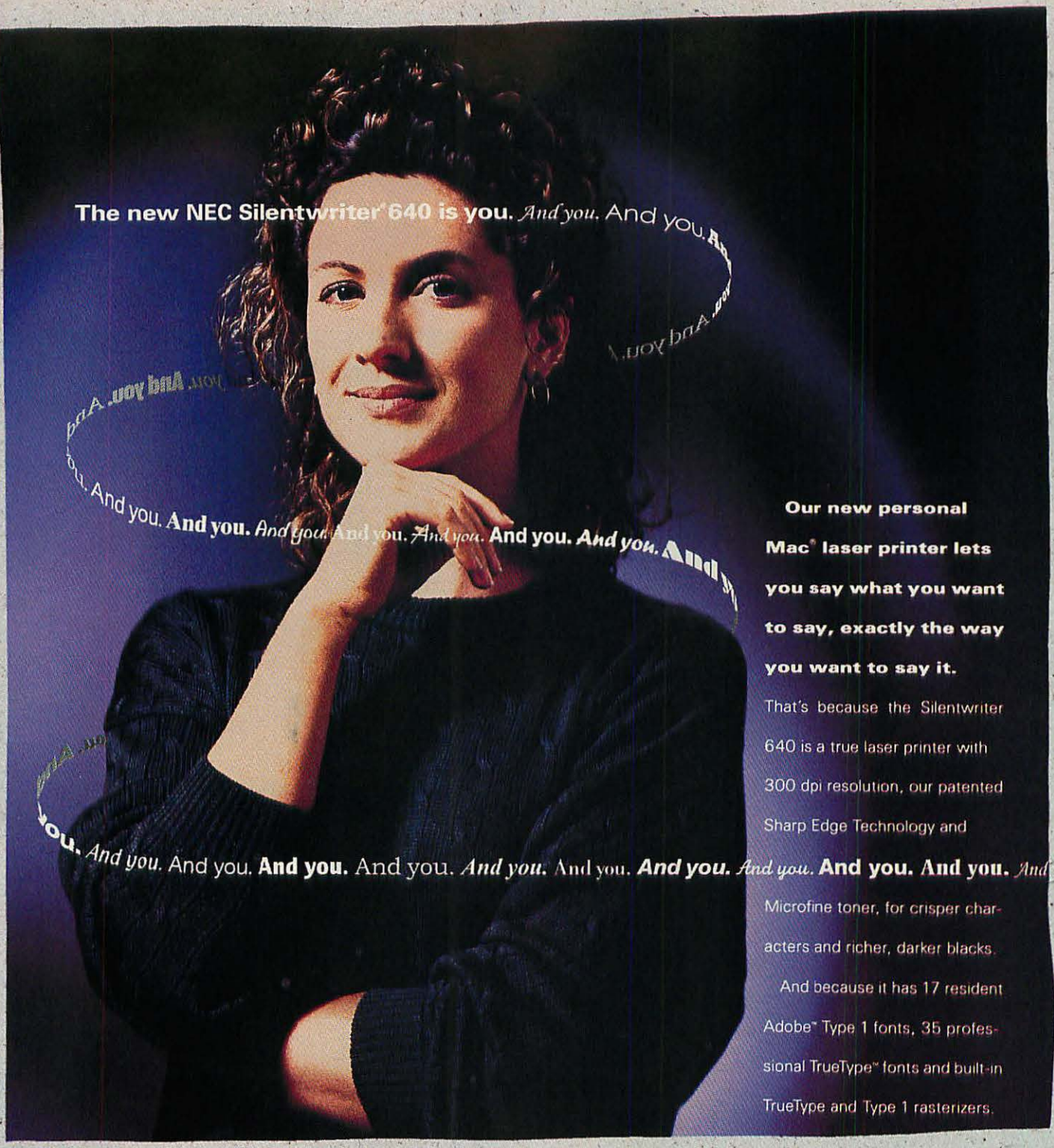

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The detail of EPSON's 4800 dpi scanner really stands

Actual 30-bit scan

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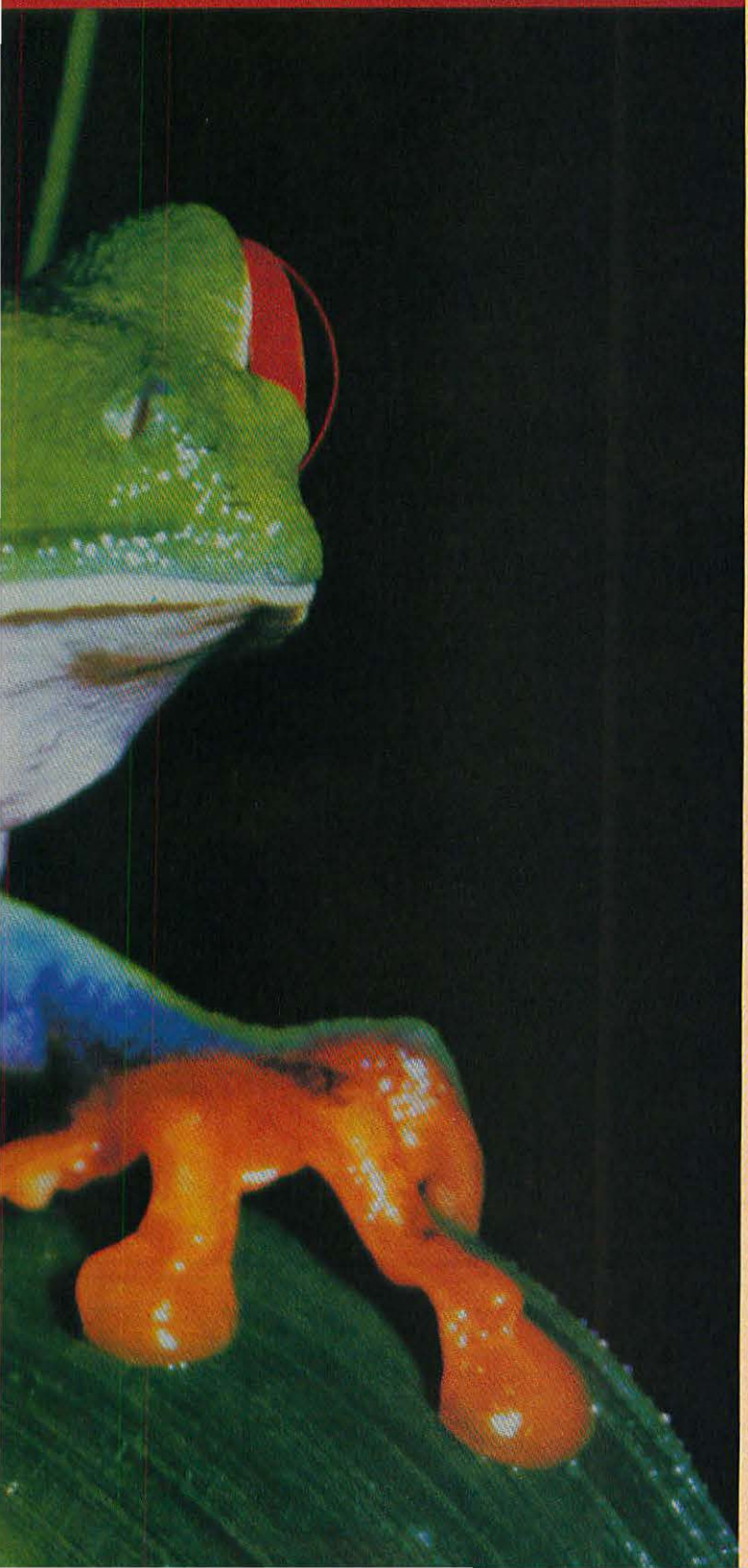

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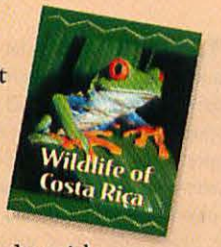

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One & Three Pass	yes	no	no	no
Dual Connectivity	yes	no	no	no

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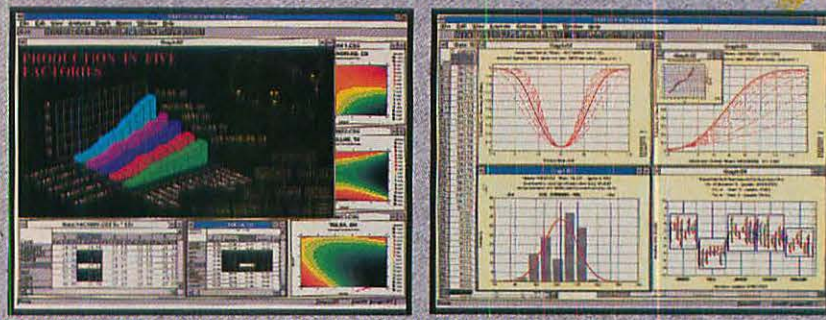

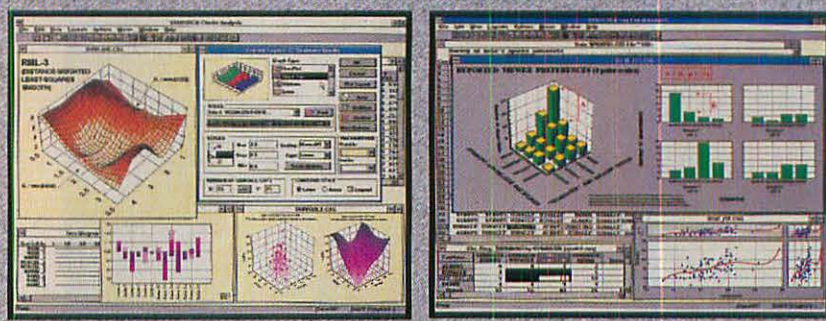

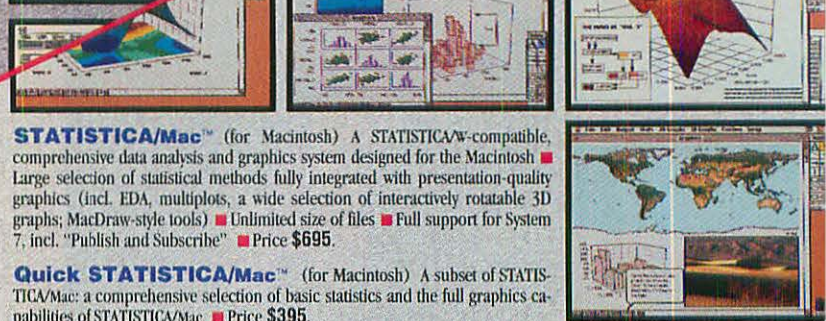

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LATE-BREAKING NEWS

MacBulletin

Apple Q4 Earnings Shine Surprising industry analysts, Apple Computer reported $2.49 billion in revenues from the fourth fiscal quarter of 1994, a 16 percent increase over the fourth quarter last year and the highest quarterly revenues in company history. Net income for the quarter was $114.7 million, up from $2.7 million during the same quarter a year ago. Apple said it shipped more than 250,000 Power Macs in the fourth quarter, for a total of more than 600,000 shipped in the seven months since introduction.

Microsoft Engulfs Intuit Microsoft is merging with Intuit, maker of the market-leading personal-financial software, Quicken. Microsoft will likely dominate another market segment and gain access to the financial-transaction and banking industries. The Justice Department has announced that it will look into the matter. To clear the way for the Intuit acquisition, Microsoft is selling Microsoft Money to Novell. Microsoft has also acquired NextBase, maker of the Automap map-generation program.

Technöggin Battery Problems Technöggin has asked customers to stop using its PowerPlate batteries for the PowerBook because of acid leakage. The company says it no longer produces PowerPlates and that it cannot pay for a recall or refund program. VST, which uses the same battery cells, continues to produce batteries and reports no significant problems. Battery supplier Portable Energy Products (PEP), which makes the cells used by both Technöggin and VST, denies Technöggin's claims and reports no unusual leakage problems. Technöggin, 513/321-1777.

From FreeHand to Illustrator Future versions of Aldus FreeHand and Adobe Illustrator—both due by summer 1995—will let users easily open and edit files created in the other program. FreeHand will be revised to support Adobe's Portable Document Format (PDF), the document interchange format at the heart of Adobe Acrobat, and Illustrator will be revised to export editable PDF files (it now imports them). 415/961-4400.

The FreeHand Shuffle Continues In other FreeHand news, Macromedia plans to acquire Altsys Corporation. If Macromedia shareholders approve in mid-January, Altsys will become Macromedia's Digital Arts Group. As for FreeHand—the illustration package Altsys developed for Aldus—Altsys is slated to gain the publishing and distribution rights to that program on January 1, 1995. Once existing retail inventories are depleted, the program will ship under its new name: Macromedia FreeHand. Macromedia will also offer Altsys's Fontographer type-creation program.

Apple Drops/Adds PowerBooks Apple is phasing out all PowerBooks and Duos with active matrix gray-scale LCD screens. The two models affected are the PowerBook 540, which is likely to be out of stock by the time you read this, and the Duo 280, which should be out of stock by Christmas. Apple also added a new configuration, a PowerBook 520c with 12MB of RAM, a 320MB hard drive, and a modem for $3949. Another new configuration, a PowerBook 540c with 12MB of RAM, a 500MB hard drive, and modem, goes for $5899 and replaces the only current 540c model.

Apple Reduces Prices for Servers Apple's servers now cost 6 to 11 percent less. The eight PowerPC 601–based Workgroup Server models now range from $2809 (formerly $3159) for the Workgroup Server 6150 with 8MB/500MB/CD to $9519 (formerly $10,269) for the Workgroup Server 9150 with 16MB/two 1GB drives/DAT/CD/AppleShare. Apple also stopped making the 68040-based Workgroup Server 60 and Workgroup Server 80 models. 408/862-3385. m

News

EDITED BY TOM MORAN

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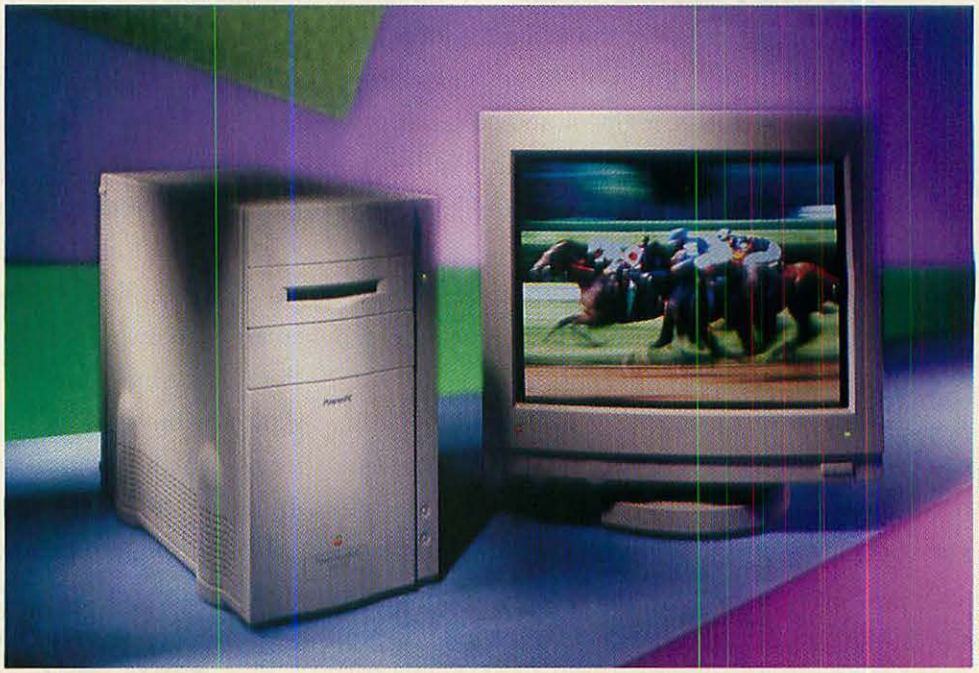
Apple Pushes Power Mac to 110MHz

Apple has introduced its fastest Power Macintosh yet, the 8100/110, which is the first Mac to use clock-tripling technology. The CPU chip runs at 110MHz, three times the motherboard's 36.7MHz speed. Earlier Power Macs used clock-doubling technology, in which the CPU runs at twice the motherboard speed. Apple expects the Power Mac 8100/110 to be the fastest Power Mac available until late spring, the earliest time the first Power Macs to use the PCI bus might begin shipping. Apple also says the 8100/110's motherboard can support even faster CPU chips, but IBM Microelectronics was unable to deliver a sufficient quantity of CPUs that run at speeds of 120MHz or faster. But faster versions may be possible later.



KEVIN CANDLAND/SCREEN IMAGE: IMAGE BANK

Apple's Power Mac 8100/110 is the most powerful mainstream personal computer to date.

The 8100/110 does not replace the 8100/80 or 8100/80AV; both are still shipping. The 8100/110 comes in just one configuration: 16MB of RAM (8MB on the motherboard and two 4MB SIMMs preinstalled, which leaves six SIMM slots open for a maximum of 264MB), a 256K cache SIMM, a video card with 2MB of video RAM (expandable to 4MB), a double-speed CD-ROM drive, and a 2GB hard drive. No AV version is available. Apple estimates the price for the 8100/110 to be about $6379, excluding the monitor and keyboard.

The 8100/110 requires System 7.5 and a new system enabler (both included); the other Power Macs require 7.1.2 or later and need no enabler. In multiuser setups that use one master system disk, Apple recommends using the 8100/110's system software, since both the 8100/110 and other Power Macs are compatible with it.

Otherwise, the Power Mac 8100/110 has the same features as the 8100/80.

Specially Designed CPU

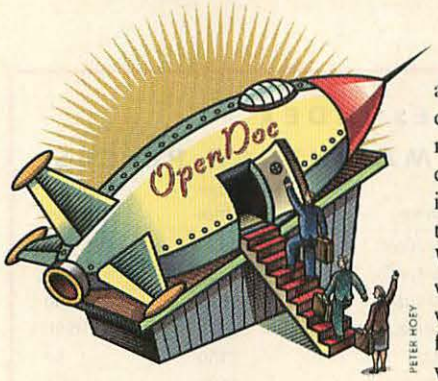
The 8100/110 contains a new variant of the PowerPC 601 CPU that uses 0.5-micron (a micron is a millionth of a meter) circuits. That's even skinnier than the circuits in

Intel's new 75MHz, 90MHz, and 100MHz Pentium CPUs (0.6 micron). IBM and Apple designed the 110MHz PowerPC 601 chip specifically for the Power Mac 8100/110; other workstations using the same chip will probably run at 100MHz, since they aren't likely to include the optimizations to the motherboard and heat sink that Apple added to the Power Mac 8100 design and that IBM allowed for in its CPU design. These optimizations are what let the new PowerPC variant reach the 110MHz speed.

Today's other Power Mac models will continue to use the standard PowerPC 601 CPU, which has 0.65-micron circuits (which compares favorably with the 60MHz and 66MHz Pentiums' 0.8-micron circuits). A smaller circuit size means a chip maker can produce more CPUs on the same silicon wafer, reducing manufacturing costs and, ultimately, system costs. More important to the end user, it means a chip requires less power, produces less heat, and therefore runs faster without experiencing the computer equivalent of the China Syndrome.
continues on page 38

Adobe Adds Zip to OpenDoc

THE NEXT OS STANDARD?



While analysts and the general business press mistakenly argue over whether Apple is already buried or merely moribund, OpenDoc, one of the company's several saving graces, is slowly readying for blastoff. The latest fuel for the document-centered component-software architecture: Adobe has joined Component Integration Laboratories (CI Labs), the OpenDoc consortium, as a full sponsor, and Lotus is also a recent member. Joining Apple, IBM, and WordPerfect (the Novell Applications Group), the two new members add significant momentum to the initiative.

Adobe chairman and CEO John Warnock said the company will create companion OpenDoc parts for the display and printing of documents in the content formats of Adobe Illustrator, Photoshop, and Premiere. Adobe decided to support CI Labs in part because OpenDoc is nonproprietary, he added.

In several of its applications, Lotus has already built in Bento (named for the Japanese word for box lunch), a portable object storage library and format used for exchanging various data types, including multimedia and compound documents. (See "OpenDoc and OLE 2.0," *Macworld*, November 1994.) Lotus was one of several developers of Bento, along with Apple, which has licensed it to CI Labs for use in OpenDoc. Current Lotus applications that use Bento include 1-2-3, Improv, and Lotus Notes VIP.

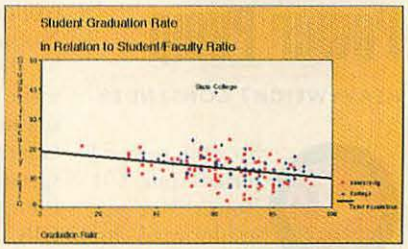
Apple hopes to release its Mac version of OpenDoc in late 1995. IBM and WordPerfect are the developers of the OS/2 and Windows versions, respectively.—T.M.

SPSS Commits to Macintosh

COMPLETE PRODUCT LINE

SPSS has been a leading vendor of statistical software for mainframes and minicomputers for more than a decade, and now the company has made a major commitment to completely revamping its entire Macintosh product line. While SPSS has previously offered a Mac version with a giant feature set, the software has been so command-line driven and text oriented that SPSS users felt like the Macintosh was serving as a dumb terminal for its own RAM.

That's all changing this December, as SPSS roars back into the Mac data-analysis marketplace with its living-color, button-driven, real-Mac SPSS 6.1—a leap of three version numbers from its current offering. The Base package ($695), which is compatible with Windows and Unix versions, offers more than 60 statistical procedures (with several different functions in each procedure), 50 chart types, and complete data-management and spreadsheet-interface facilities.



It took a few years, but the vast array of tools in the SPSS system now work through a real Mac-graphics interface.

Add-on modules ($395) to the Base package will include Advanced Statistics (mostly advanced regression tests), Trends (time-series forecasting), Professional Statistics (includes cluster and factor analysis), Tables, and Categories. When it ships, the full SPSS 6.1 suite will be the most complete statistics system available for the Macintosh.

The software will become available first in versions for 68040-based Macintoshes. Versions for Power Mac machines should follow in a few months, according to SPSS.—CHARLES SEITER

In Brief

SoftWindows for Quadras

Insignia Solutions is shipping a version of SoftWindows, its Windows-emulation software, designed for 68040-based Macs. The company recommends 16MB of RAM and, to run Windows and DOS, at least 23MB of free disk space. DOS and standard-mode Windows applications run roughly as fast as on a 25MHz 80386SX, according to Insignia, but they cannot run enhanced-mode Windows applications. The software supports PC CD-ROMs, serial-port emulation, printing, and networks. It lists for $499, and there are upgrades from Insignia's SoftPC. 415/694-7600.

PBS Online Starting Up

The Public Broadcasting Service is providing affiliate stations with the opportunity to join PBS Online, a nationwide bulletin board system made up of local stations joined by FirstClass servers. In preparation, PBS has licensed 1,000,000 copies of the FirstClass client software. Individual viewers will dial up their local PBS station's bulletin board for a mix of program-oriented content and local events. It won't cost users anything to connect to PBS Online, which PBS plans to have up and running in a few months. Contact your local PBS station for details on its participation.

Gold Prices Fall

Global Village is now shipping the Teleport Gold II, a $155 version of its popular, premium-priced 14.4-Kbps fax modem. The scaled-down Teleport Gold II is smaller than its full-size sibling and minus the OCR, but still sports Global Village's own fax software, GlobalFax, as well as ZTerm, America Online, and ARA and online-service scripts. A similar version—sans ZTerm and America Online—is bundled with Apple's new Performa 6100s. OCR software is available separately for $49. 415/ 390-8200.

FWB Deploys RAID 5

SUPPORTS HOT SWAPPING

How long could you afford to be without your data if your server array went down? For readers with answers in the microsecond range, FWB has a fault-tolerant, RAID 5 array with a backup drive and power supply. The SledgeHammer FT contains six SCSI-2 Wide drives—five are used as data drives, while the sixth is on standby as an automatic spare. In the event of a drive failure, the array automatically and transparently rebuilds the data from the failed drive on the spare drive, without any system downtime. Similarly, if a power supply or fan fails, the SledgeHammer FT automatically switches over to a backup and notifies the system administrator over the network. All drives, both power supplies, and two of the four fans are hot-swappable.

The SledgeHammer FT array comes in 6.8GB ($28,999), 8.2GB ($26,499), and 16.4GB ($35,499) configurations, all with a DDS-2 DAT (up to 16GB per tape) drive built in. The arrays feature average access times as fast as 2ms, and sustained data-transfer rates up to 15 MBps in RAID 5 mode. FWB includes a SCSI JackHammer (a SCSI-2 NuBus card), SledgeHammer FT ToolKit array setup and monitoring software, and Dantz's Retrospect Remote backup software. FWB, 415/474-8055.
—CAMERON CROTTY

THE AMCOEX INDEX OF USED MACINTOSH PRICES

Machine/RAM/Hard Drive	Average Sale Price	Monthly Change
PowerBook 100/4MB/20MB	$575	$0
PowerBook 140/4MB/40MB	$750	–$25
PowerBook 180/4MB/80MB	$1500	–$50
PowerBook Duo 230/4MB/80MB	$825	–$50
Mac Classic/2MB/40MB	$350	$0
Mac SE/30/2MB/40MB	$500	–$50
Mac LC II/4MB/40MB	$500	$0
Mac IIsi/3MB/40MB	$550	$0
Mac IIci/4MB/80MB	$750	–$50
Mac IIfx/4MB/80MB	$875	+$25
Centris 650/8MB/230MB	$1200	–$50
Quadra 900/8MB/160MB	$1850	–$150

Index provided by the American Computer Exchange of Atlanta (800/786-0717). It reflects sales during week of October 20. Configurations include keyboard and exclude monitor and display board for noncompact models.

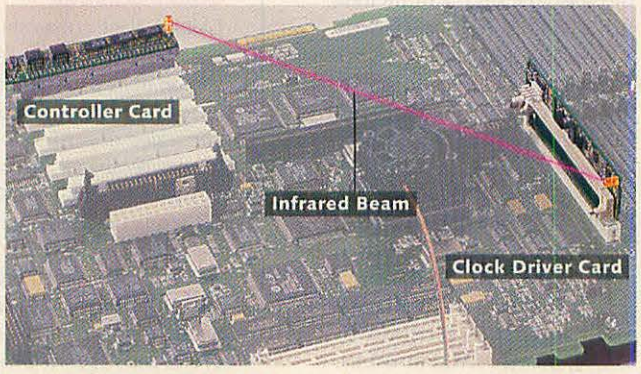
Double-Duty Power Pump

HEAVYWEIGHT CONTENDER

So you popped for an Apple 601 Power Mac upgrade card for your Quadra, but the new 110MHz Power Macintosh 8100/110 (see "Apple Pushes Power Mac to 110MHz," *News*, in this issue) is making you drool as you poke along at a measly 50MHz or 66MHz? Newer Technology has announced the Power Pump, a hardware package that accelerates both the 68040 processor on the Quadra 700, 900, or 950 motherboard and the PowerPC 601 chip on Apple's upgrade card.

The Power Pump's Controller Card resides in the NuBus slot partially blocked by the Apple upgrade card, while the Clock Driver Card sits in the ROM socket. The Controller Card receives the speed setting from the Power Pump control panel, and the CPU setting (PowerPC or 680X0) from Apple's PowerPC Upgrade Card control panel. Via an infrared beam, the Controller Card sends the speeed and CPU setting to the Clock Driver Card, where it is stored in nonvolatile memory for the next restart. The Power Pump control-panel software can independently adjust the speed of the 68040 and PPC 601 chips. The Pump can accelerate 25MHz 040 chips to 30MHz, 33MHz chips to 40MHz, and any PowerPC 601 chip to 70MHz to 80MHz. Readers should note that these specs are the manufacturer's estimates—individual chips' tolerance for acceleration varies.

The package should list for around $350, and is expected to be available by the time you read this. Newer Technology, 316/685-4904.
—CAMERON CROTTY



SCOTT PETERSON

Shown here are the two pieces of Newer Technology's Power Pump accelerator installed on a Quadra 950 motherboard. The Clock Driver Card (in the ROM socket) carries the oscillator chip, which accelerates the CPU. Note that the illustration does not show the Apple Upgrade card.

Retooling MacTools

USER-ASSISTED DISK DIAGNOSIS

Central Point (a division of Symantec) has a tip for users who know that something's wrong with their data but aren't quite sure what it is. The QuickAssist and SmartTips features of MacTools Pro 4.0 help users diagnose hard disk problems based on symptoms that the users identify. Once the problem has been narrowed down, MacTools Pro automatically takes corrective action (if it can), or suggests other system problems the user might check (if it can't).

AutoCheck has also been enhanced in version 4.0 with an AutoRepair utility; the software now automatically fixes most of the problems it finds, without requiring a system reboot or even user involvement. Other changes in the MacTools Pro 4.0 package include the ability to create a recovery disk on the Mac's built-in RAM disk, a faster Optimizer utility, and completely Power Mac native versions of Optimizer, TrashBack, and the MacTools Clinic. MacTools Pro 4.0 is currently available for $149.95 and includes both 680X0 and native Power Mac code. MacTools 3.0 users can upgrade for $49.95. Symantec, 503/690-8088.—CAMERON CROTTY

Petite Portable Printer

ONE POUND, LASER QUALITY

Citizen America says it has introduced the smallest laser-quality printer in the world. The 1-pound PN60 produces monochrome and color output using thermal-fusion technology. About the size and shape of a compact

TOM GIBSON

The Citizen PN60 weighs 1 pound and prints 2 laser-quality pages per minute.

umbrella, the QuickDraw-based PN60 can print 2 monochrome pages per minute at 360 dpi and 1 color page every 2 minutes.

Expected to begin shipping in mid-November, the PN60 has a suggested list price of $429. On-the-road options include a $79 half-pound battery and a $59 adapter for a car's cigarette lighter. The printer supports TrueType and Adobe PostScript Level 1 fonts and has five built-in fonts. Pages are hand-fed through the printer, and users can print on plain paper, envelopes, and transparencies. Toner ink is supplied in tiny cartridges that cost $8.99 for 2 and print 30 to 40 pages each. Color cartridges are $13.99 for 2 and print 4 to 7 copies per cartridge. Citizen America, 310/453-0614.

—JOANNA PEARLSTEIN

BUGS & TURKEYS

After Dark 3.0 users have reported crashes when running Norton Utilities' FileSaver, BestWare's M.Y.O.B., or certain After Dark minimodules when After Dark's password protection is turned on. Berkeley Systems expects a fix, called version 3.0a, to be available in late November. Registered users should be able to call to request the new version from Berkeley Systems or download it from most online services and the Internet. Berkeley Systems, 510/540-5535.

Symantec Antivirus for Macintosh (SAM) 4.0 doesn't remember when users tell it to ignore a suspicious item like a preference file or extension. SAM also fails to scan a floppy disk when the application is open and the disk is inserted into the drive. A Symantec representative says version 4.0.1, scheduled at press time to be released soon, will fix these problems. The company will mail the new version to users who request it. Symantec, 503/334-6054.

Apple recommends that Power Mac users turn on virtual memory for maximum performance. But Frame Technology's FrameMaker for Power Macintosh crashes when users import Microsoft Word files into the application and virtual memory is turned on. Frame promises a fix in the next version but won't say when it will be available or how much it will cost. In the meantime, users can either turn off virtual memory when using filters, or call Frame's technical support to learn how to edit the application's data fork. Frame Technology, 408/975-6466.

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-Shirt if we shoot your turkey in this space. See *How to Contact Macworld.*

Mosaic Goes Commercial

WWW BROWSERS HIT MARKET

Following the wave of commercial organizations trying to capitalize on the last free place, the Internet, several companies have licensed Mosaic from the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Champaign-Urbana. While the free version of NCSA Mosaic is available on the Internet and online services, augmented commercial Macintosh versions are now becoming available from Mosaic Communications Corporation (MCC) and Spyglass.

MCC has announced Mosaic NetScape Network Navigator, a commercial rewrite of Mosaic by one of its originators. NetScape lets users work with documents while downloading them and provides support for encryption and the JPEG file format. MCC has also announced the Mosaic NetSite Communications Server, which is aimed at users setting up or maintaining their own World Wide Web site. The server will first be released on the Unix platform; a Macintosh server product is expected in 1995. NetScape will be offered for a nominal price with the server, which is $5000.

Spyglass's Enhanced NCSA Mosaic for Macintosh Release 1.0 requires less memory than its freeware sibling, supports multiple windows, offers faster performance, and has online help. The Spyglass product is available in 680X0 and native Power Macintosh versions. Spyglass is not selling the product directly; it's available in bundles from a number of third-party companies, including FTP Software (508/685-4000) and O'Reilly & Associates (707/829-0515). Mosaic Communications, 415/254-2601; Spyglass, 217/355-6000.—JOANNA PEARLSTEIN

In Brief

The Disability Connection

eWorld, Apple's online service, has added a forum designed for people with disabilities. Called The Disability Connection, the new service is designed as a resource for information, a discussion center for individuals, and as a contact point for individuals and disability-related companies and organizations. 408/996-1010.

Comm Firms Merge

U.S. Robotics and Megahertz Holding Corporation have announced that they are merging. The companies said the reason for the move was to combine U.S. Robotics' strength in desktop and data-center communications with Megahertz's experience in mobile communications and related areas. At press time the merger effort still needed to be approved by stockholders and federal regulators.

V.34 PCMCIA Modems

In related news, U.S. Robotics has begun shipping four fax modems that can fit into PCMCIA 2.1 slots. Two Sportster (single-user) models are available in V.32 or V.34 versions and list for $259 and $499, respectively. Two Courier (network capable) models also come in V.32 and V.34 versions, at $499 and $575, respectively. 800/342-5877.

Recordable CD Price Drop

Pinnacle Micro recently slashed the price of its RCD-1000 Recordable CD Backup System by about a third from $2995 to $1995. The double-speed drive can back up a network server or other system, or it can be used to create multimedia CD-ROM discs as well as audio and video CDs. The recordable drive comes with software that lets it work with Macintoshes or Windows machines, in formats including ISO 9660, HFS, CD-XA, and CD-I. Blank CD discs list for $29. 714/789-3000.

"POWER MAC 8100/110" *continued*

The 8100/110's CPU is also the first CPU that includes an integrated heat pump. Fast chips become hotter than slower chips, so system designers using faster chips need to ensure better airflow and sometimes install cooling fans. For example, early Pentium CPUs suffered from excess heat and required a complete redesign of PC motherboards. Apple has avoided such a redesign by working with IBM to add what are essentially two wires to the CPU. These wires connect to a heat sink outside the CPU, transferring the heat directly away from the CPU in a pumplike action. Other CPUs let the heat dissipate at its own pace through the silicon die (the part that contains the circuitry) to the surrounding case and heat sink.

NuBus Flaws Fixed

Apple is aiming the Power Mac 8100/110 at professional publishers and multimedia authors. One common request of such users has been that Apple fix the earlier Power Macs' NuBus control chip, called the Bart chip, to allow burst-mode data transfer between NuBus cards, the way multiple-card products do in video editing. This mode allows fast communication of large amounts of data. Apple has added this capability to the 8100/110 and fixed some of the bus-timing errors that make other Power Macs slower than the Quadra 840-AV for certain data transfers used in RAID systems and video editing.

The company has also fixed a bug in the ROM that previously limited the number of slots you could add through a third-party expansion chassis such as those made by Second Wave. (The Power Mac 8100 has three NuBus slots.) Apple says this support for more slots (called superslot addressing) should increase data-transfer rates for several high-speed cards, since the cards use the higher-bandwidth data structure that superslot addressing provides, even if there is no expansion chassis present.

However, Apple does not currently have plans to incorporate either the Bart or ROM fixes into the other Power Macs. Furthermore, there is no 8100/110 upgrade board, so 8100/80 owners faced with the NuBus problems cannot presently buy an upgrade board to fix the problem and increase system speed.

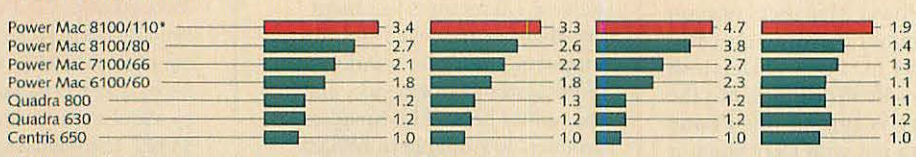
The Power Mac 8100/110 is also about 21 percent faster than an 8100/80. That speed gain is less than what you might expect, based on the speed difference of 38 percent between a 110MHz CPU and an 80MHz CPU. The reason is that CPU performance is not the only factor in overall system performance. One significant factor is that the Power Mac 8100/110's motherboard runs at 36.7MHz, compared with the 8100/80's 40MHz. In both Power Macs, the CPU makes calculations faster than the motherboard can handle them, which introduces some time lag as the CPU pauses to let the motherboard catch up. The lag between the 8100/110's 110MHz CPU and 36.7MHz motherboard is greater than the lag between the 8100/80's 80MHz CPU and 40MHz motherboard, which reduces the actual speedup the 110MHz CPU offers. The video system is the same on both 8100 models, which also moderates the 8100/110's overall performance.

—GALEN GRUMAN

How the 8100/110 Stacks Up

MW LAB

■ = Best result in test.
Results are times as fast as a Centris 650 (Centris 650 = 1.0). Longer bars are better. Products are in decreasing order of overall performance.



*Prerelease unit; performance of shipping unit may vary slightly.

BEHIND OUR TESTS

Macworld Lab tested several functions in eight key programs plus the Finder to determine real-world performance for the three critical performance areas faced by most users: basic processing ability (the CPU-Intensive results), math processing ability for specialized applications like modeling and data analysis (FPU-Intensive results), and hard-drive performance (the Disk-Intensive results). We then averaged the results (giving the CPU-Intensive category 60 percent of the weight) to derive the overall score, which gives most business users an accurate measure of their Mac's performance. These results are not comparable with previous Macworld Lab benchmarks. We tested native versions of software on the Power Macs and 680X0 versions on the 040 Macs. The software tested includes System 7.5; Adobe Illustrator 5.5, PageMaker 5.0a, Photoshop 3.0, and Premiere 4.0; Fractal Design Painter 2.0; Microsoft Excel 5.0; Specular International Infini-D 2.6; and Wolfram Research Mathematica 2.2.2. Our 680X0 Macs had 16MB of RAM, while the Power Macs had 24MB. All systems were run with 8-bit color on 16-inch monitors.—**Lab testing supervised by Danny Lee and Mark Hurlow**

Typhoon 20 Printer

OFFERS FLEXIBLE SETUP

For networks with many users, Dataproducts has introduced the Typhoon 20, a PostScript Level 2 network printer that produces up to 20 pages per minute on paper up to 11 inches by 17 inches. The printer includes a Fuji-Xerox XP-20 print engine; a fast RISC processor; 8MB of RAM expandable to 72MB; PCL5+ emulation; 35 typefaces; and DpTek's TrueRes, which Dataproducts said improves curves and edges with no reduction in speed. TrueRes works in either 300-dpi or 400-dpi mode. The Typhoon also can print at 600 or 800 dpi, or at 300 or 400 dpi without TrueRes.

PAUL BERG

The Typhoon 20 produces 20 ppm and tracks how many pages different users print.

The Typhoon 20 also has "resource accounting," that is, it can track how many pages various users have printed. Its VPT 3.0 software can create as many as 64 "virtual printers," each configured for a particular user's needs. VPT 3.0 also provides automatic emulation switching; remote configuration and management of the printer; and support for Unix TCP/IP, LPD, EtherTalk, DEC LAT, and NetWare 3.X network protocols and 22 network operating systems. The printer is shipping at a list price of $4495 with one 250-sheet paper tray. The Typhoon 20 can have up to three trays. Dataproducts, 818/887-8000.—T.M.

Introducing a printer for those who have ideas bigger than this page.

The HP DesignJet 650C/PS printer. Large-format at a small price.

$8,995*

Go on. Give yourself room to think. With the HP DesignJet 650C/PS, you can now print in sizes up to 2′ by 9′ (up to 3′ by 9′ with our larger model**). Right in your office. Right away. No tiling. No hang-ups. No problem. Just clean, inkjet output with PANTONE®†-licensed colors. Adobe™ PostScript™ Level 2 software and a built-in RIP are included. For an output sample, call **1-800-354-7622, Ext. 8277.**

HEWLETT® PACKARD

Circle 11 on reader service card

*Suggested U.S. list price. **Larger model lists at $10,505. †Pantone, Inc.'s check-standard trademark for color. Adobe and PostScript are registered of Adobe System Inc. which may be registered in certain jurisdictions. ©1994 Hewlett-Packard Company PE12410

Power Mac News

IBM, Apple Move to Joint Platform

NEW POWERPC COMPUTER STANDARD IN THE WORKS

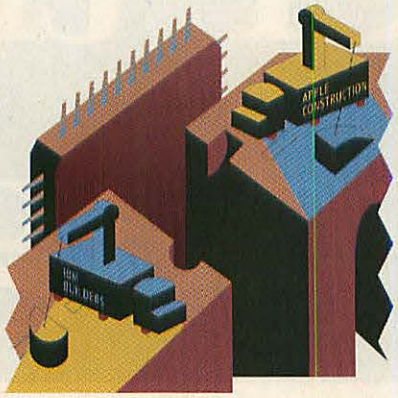
After years of conflicting signals about how closely the two personal computer giants would really collaborate, IBM and Apple signed an agreement on November 7 to develop a converged PowerPC platform standard that can run a variety of operating systems, including the Mac OS. The two companies have abandoned efforts to port the Mac OS to IBM's PowerPC Reference Platform (PReP), the system configuration on which IBM has based its first PowerPC computers. (IBM expects to release PReP systems in the spring, running Windows NT and IBM's AIX variant of Unix.)

"For the current PReP boxes, we have planned to support AIX, OS/2, Windows NT, and Solaris," says Gary Griffiths, director of business development for IBM's Power Personal Systems division. "On a converged platform we would hope to also support System 7.5, and NetWare if Novell is ready [in its current development efforts] to be on the platform by then."

"We believe DOS and Windows will run fine, [including] Windows 95, which is backward-compatible enough so that should not be a problem," says Jim Gable, Apple's Power Macintosh product-line manager. He says that Apple might bundle Windows 95 with machines based on the new standard, and will offer a Mac OS license to any company that adopts the new standard.

"IBM and Apple will be working on this jointly, with cooperation with some OEMs that have signed up to build computers around this common platform, including Toshiba, Canon, and Groupe Bull," Gable adds. "I anticipate that anyone who has signed up for PReP will want to migrate over to the common platform."

IBM, Apple, and any other company that chooses to build machines based on the converged-platform standard would come up with their own licensing schemes for bundling operating systems. Griffiths predicts that IBM will ship systems with a CD-ROM containing encrypted versions of all the operating systems that the company produces or licenses.



JAMES R. O'BRIEN

IBM developed PReP, which closely resembles the standard PC architecture, as a guide for builders of PowerPC-based clones. Those companies can use PReP to build clones with off-the-shelf chip sets and adapters. PReP had been considered a critical tool for PowerPC computers to win market share from Intel-based machines. The failure to convince Apple to adopt the PReP standard put a huge dent in that strategy.

"The biggest problem with PowerPC in the marketplace, is 'What hardware should I be using, and what operating system can I use on it?'," says Linley Gwennap, editor-in-chief of *Microprocessor Report*, a respected newsletter that follows the chip industry. A converged-platform standard could eliminate that problem, he adds.

In some cases a PC based on the converged platform would look like a PC, in some cases like a Macintosh, and in some cases it would support components designed for either PCs or Macs, such as choice of keyboard types.

But don't look for Apple and IBM to comarket systems. "Comarketing is probably not something that makes a lot of sense from a practical perspective, and I suspect it would run into a lot of problems in the Justice Department, also," according to Griffiths.

continues on page 42

Fast PCs for Power Macs

66MHZ 486DX2 CARD FOR POWER MAC 6100

Continuing its adoption of cross-platform computing as a fundamental business, Apple has announced a new card that adds a 66MHz 80486DX2-based PC to a Power Mac 6100 for release in November 1994. The card cannot be used in any 680X0 Mac or in any other Power Mac but the non-AV 6100 model. The card comes with MS-DOS 6.22 and—a first for Apple—Windows 3.11. Also, Apple plans to release in January 1995 the Power Mac 6100 DOS Compatible system, which includes the card, 16MB of RAM, a 350MB hard drive, and DOS preinstalled. The system will not include an internal CD-ROM drive, and the user must install Windows. Apple estimates the card will cost $600 and the DOS Compatible system will cost $3000 excluding monitor and keyboard (about $700).

Significant additions to the PC card are support for networking (both Novell IPX for NetWare and TCP/IP for Unix) and a SoundBlaster-compatible daughtercard for audio, which is the standard

for multimedia PCs and which an Apple product manager conceded is better than the Mac's built-in audio. The daughtercard includes jacks for connecting the SoundBlaster audio to the Mac's internal stereo circuitry and to Apple's 300i internal CD-ROM drive. You can also connect a game controller, such as a joystick, to the PC card via a connector attached to the card's video cable.

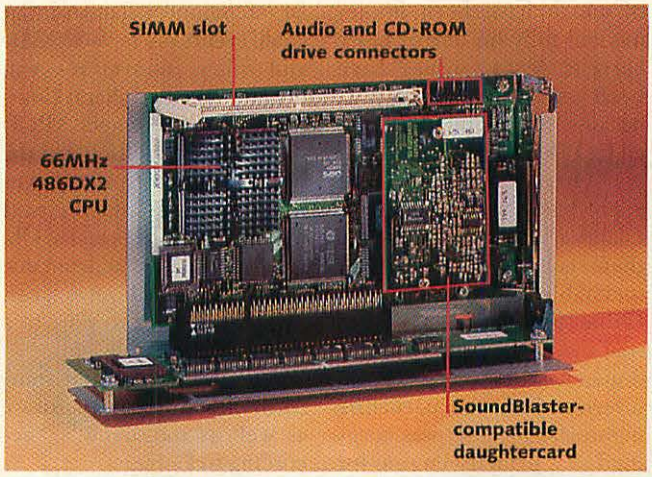
Apple has also added software to support PCL-based printers, such as the Hewlett-Packard LaserJet series, that are the most common in PC environments. The software also lets the card print to Epson-compatible printers, which includes most PC dot matrix printers. Other software controls include copy and paste of PICT, Rich Text Format text, bitmap images, and plain text between the Windows and Mac environments, plus the ability to make Mac drives or folders accessible by the PC card as if they were a DOS drive.

The Apple PC card supports VGA and Super VGA monitors, but at a lower refresh rate than most PCs' video circuitry or card would; this could result in flickering. For 14-inch (640-by-480-pixel) resolution, it supports 256-color display; for 17-inch (800-by-600-pixel) resolution, it supports 16-color display. You can also use the card with the Power Mac 6100's monitor, using a hot-key combination to toggle between the Mac and PC screens.

Apple's previous card and DOS-capable system, which shipped for less than three months in spring 1994 as stocks ran out, used a 25MHz 80486SX CPU (which has no FPU, unlike the 80486DX and 80486DX2 lines), did not include Windows, did not support networking, and did not support SoundBlaster audio.

The Apple card requires a Power Mac 6100 with 12MB of RAM, which the Mac and the PC card share in user-defined amounts. You can also install a 72-pin SIMM on the PC card for exclusive use by the card; in this case, the RAM on the Mac's motherboard is reserved exclusively for the Mac.

Apple Computer, 408/996-1010.—GALEN GRUMAN



Apple's new PC coprocessor card adds a 486DX2-based system to a Power Mac 6100. It includes PC network and multimedia support.

Apple, DayStar Ship Upgrade

POWER MAC CARD FOR 040 LCS, PERFORMAS

Apple and DayStar Digital both planned to begin shipments in mid-November of a card that converts an 040-based LC or Performa, as well as some Quadras, into a Power Macintosh. The jointly developed card will cost $599. Apple will call the card the Power Macintosh Upgrade Card for Entry-Level Macintosh, while DayStar will call it the PowerCard 601.

First announced in August 1994, the upgrade card works at 66MHz in a Quadra, LC, or Performa 630; LC 575; or Performa 570–series Mac. It works at 50MHz in a Quadra 605, LC 475, or Performa 470–series Mac. These Macs —often dubbed the LC 040s—all use the LC III–style Processor Direct Slot and have an 040 processor. Macworld Lab tests of a prerelease unit show that the upgrade card's performance at 66MHz is comparable to a Power Mac 7100/66 (see the benchmark chart "What PowerPC Offers Entry-Level Macs").

To convert 040-based Macs that use a Quadra PDS (the Centrises, and all non-AV Quadras but the 605 and 630) to Power Macs, you would use Apple's $699 Power Macintosh Upgrade Card, which has been shipping since March 1994. There is no Power Mac card for AV Quadras.

Like the Apple upgrade card for the Quadra-PDS Macs, the new card works by running the PowerPC CPU at twice the speed of the Mac's 040 CPU. Also like the other Apple card, the new card leaves the 040 in place, so you can set the Mac to start up as an 040 Mac or as a Power Mac. The ability to make the Mac run on the 040 is useful for the few programs that don't work on a Power Mac (typically those that require an FPU), or where performance under 680X0 emulation is too slow (such as for Adobe Photoshop 2.5).

Unlike the Apple upgrade card for 040 Macs with the Quadra PDS, the new upgrade card for the LC 040s does not plug into the PDS. That's because the LC III–style PDS is too slow to handle the high-speed transfer needed to take advantage of the PowerPC CPU. The new upgrade card plugs into the 040's CPU socket, bypassing the PDS and its data-throughput bottleneck.

Apple requires that a dealer install the upgrade card it sells for the LC 040s. DayStar includes instructions for user installation. The cards are identical—DayStar designed the hardware and Apple designed the software. The only other difference between the two companies' packages is the warranty: Apple offers its standard one-year warranty, while DayStar offers a three-year warranty. Apple, 408/996-1010; DayStar, 404/967-2077.—GALEN GRUMAN

MW LAB What PowerPC Offers Entry-Level Macs

= Best result in test
Results are times as fast as a Centris 650 (Centris 650 = 1.0). Longer bars are better. Products are in decreasing order of performance.

	Overall Score Indicates typical performance in a mixed-use environment, such as a company or school.	CPU-Intensive Indicates performance for most business and personal tasks.	FPU-Intensive Indicates performance for analytical, 3-D, and other specialized uses.	Disk-Intensive Indicates performance of the Mac's data-transfer capabilities, which affects all users.
Power Mac 8100/80	2.7	2.5	3.8	1.5
Quadra 630 w/ Power Mac upgrade*	2.1	2.0	2.9	1.1
Power Mac 7100/66	2.1	2.2	2.7	1.3
Quadra 630	1.2	1.2	1.2	1.2
Centris 650	1.0	1.0	1.0	1.0

** Prerelease unit; performance of shipping unit may vary slightly.*

BEHIND OUR TESTS See the chart "How the 8100/110 Stacks Up" in *News*, in this issue, for test details.
—Macworld Lab testing supervised by Danny Lee and Mark Hurlow

"JOINT PLATFORM" *continued*

The converged standard is based on "a single motherboard that will handle all of the operating systems," he says. Any of the PowerPC software written for any of those operating systems today will be 100 percent binary-compatible on the converged platform. It will operate on converged-platform products—without recompiling—when they hit the street in 1996. The converged platform will make the Mac and PowerPC market large enough to attract developers who now largely ignore alternatives (such as the Mac and OS/2) to DOS and Windows, says Gable.

Problems with PReP

IBM and Apple are creating the new platform standard to address the insurmountable barriers to porting the Mac OS to PReP, Gable says.

The only similarities between a Power Mac and PReP-based machines, Gable notes, are memory SIMMs and the PowerPC CPU itself. Disparities invisible to users, such as those within hardware memory registers, create "a pretty puzzling challenge to bring System 7 over there." Only the SCSI and IDE bus standards, and Ethernet—all of which have been implemented fully on one or more current Macs—would have been relatively easy to port because they are fully supported by PReP.

"Overall, you're looking at a product that would [have taken] a long time to create; then you'd be looking at inevitable incompatibilities," Gable says. Apple concluded that even if the job could be done, it would result in an inferior Mac—a marketing nightmare for what was imagined as a primary engine for the Mac clone market.

"The turning point was when IBM decided that they could make big changes in PReP," Gable reveals. "The new design includes ASICs [application-specific integrated circuits] and hardware registers that are a combination of Macintosh and PReP [components]. Supporting this platform is similar to supporting a new Macintosh—there's a lot of software work to do, but it's the kind of work Apple's done in the past. To Apple, this machine will look very much like a new Power Mac."

Concerns about implementing future technologies did not contribute to the decision to abandon PReP, however. Firewire (a high-speed serial interconnect standard that could eventually replace SCSI) and other innovations will plug into the Peripheral Component Interconnect (PCI) bus, which both PReP and the next generation of Power Macs support. And the next major revision of the Mac OS, code-named Copland and due for release in about a year, should be easier to port to a PC platform, Gable adds.

But the converged standard will run "today's software as well as tomorrow's," according to Gable.

Griffiths says that the biggest incompatibility problem—the memory map and memory subsystem—will be corrected on the converged platform.

Apple's work with the PCI bus and its adoption of PCMCIA for the 500-series PowerBooks should ease many of the I/O challenges of porting System 7.5 to the converged-platform specification.

Licensing Effects

Contrary to earlier statements, Apple now says it will consider any company as a possible licensee, including the top six PC makers.

"Any company that builds a machine based on the common hardware platform can license the Mac OS if they like," Gable says. "It creates a base for completely open licensing . . . No company wants to stand up and say that they are licensing yet, though it's pretty obvious that some will." He expects licensing announcements to follow on the heels of the platform-standard announcement.

"We're not going to make any announcement regarding Mac clones, though that's something on the table both ways—bilateral licensing," says Griffiths, indicating that Apple might want to license OS/2 or AIX for its servers. If IBM does license the Mac OS, "It would be a straight per-copy deal; it wouldn't be a matter of making investments in the technology," Griffiths adds.

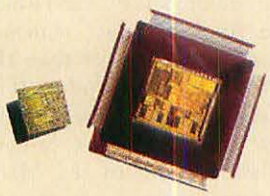
Martin Reynolds, director of technology assessment at Computer Intelligence InfoCorp, is skeptical about the long-range potential of the converged-platform standard. "The enterprise is very heavily dominated by Intel-Microsoft machines. A Pentium machine is going to be $2500. My bet is that an IBM/Apple machine is going to be significantly more expensive because the only reason for IBM to do this is to make a higher profit on the [PowerPC] systems.

"If they succeed in establishing a common platform and licensing it to other companies, then you can expect those other companies to sell at low prices to gain market share," Reynolds adds.

Griffiths discounts the rumors, caused by speculation about the converged-platform agreement, that IBM would buy or invest in Apple: "All these stories of IBM's funding huge sums of money are completely unfounded. This is a deal where essentially no money is changing hands."

However successful Apple and IBM are in licensing the Mac OS and the converged platform, the agreement means that Apple will continue to captain its own fate, even as it abandons a strict go-it-alone strategy.

—CHARLES PILLER



LUIS DELGADO

Shrinking CPUs

IBM Microelectronics' new 0.5-micron PowerPC 601 CPU (left) is smaller than even the newest (0.6-micron) Pentiums. The new 110MHz Power Mac 8100/110 uses the new 601 (see "Apple Pushes Power Mac to 110MHz," *News*, in this issue). But already, PC makers are offering notebooks using the new Pentium, while Macintosh users continue to wait for PowerPC-based PowerBooks.

Why Apple Rejected PReP

INSUFFICIENT SUPPORT FOR MAC STANDARDS

The following conflicts and incompatibilities helped kill discussions of porting the Mac OS to PReP:

- The Mac OS relies heavily on ROM, while PReP uses a limited BIOS (a subset of ROM) only for booting and for low-level devices, such as monitors and floppy drives.
- Approaches to video addressing, as well as serial and parallel ports, posed a vast array of incompatibilities. "You can almost pick any area of I/O you please, and find some technical problems with it," says Apple's Power Mac manager, Jim Gable.
- PReP lacks an ADB equivalent. Although this could have been solved with an add-on card, Gable notes, "You've got to figure out what would make a good end-user product; too many add-ons could result in too complex a product."
- PReP offers no hardware support for the Apple LocalTalk networking standard.

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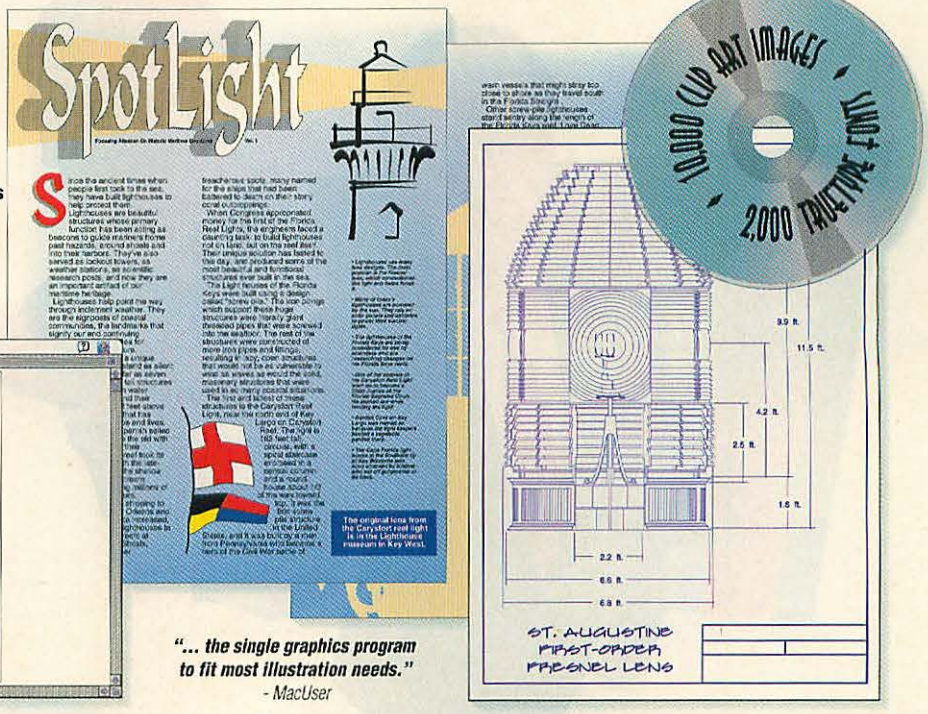

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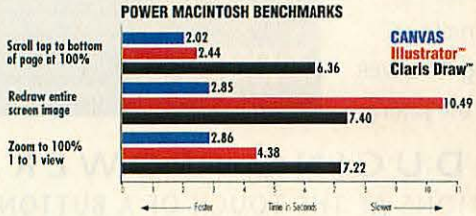

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Circle 91 on reader service card

New Products

THE LATEST MACINTOSH RELEASES

by Cameron Crotty

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY *MACWORLD*. UNLESS OTHERWISE STATED, THE MINIMUM REQUIREMENTS FOR OPERATION ARE A MAC PLUS WITH 1MB OF RAM, RUNNING SYSTEM 6. A ◆ SIGNIFIES THAT A NATIVE POWER MAC VERSION OF THE PRODUCT IS AVAILABLE. ALL INFORMATION AND PERFORMANCE CLAIMS ARE SUPPLIED BY THE PRODUCT VENDOR AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY *MACWORLD*. ALL PRICES ARE SUGGESTED RETAIL. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

HARDWARE

CDS654

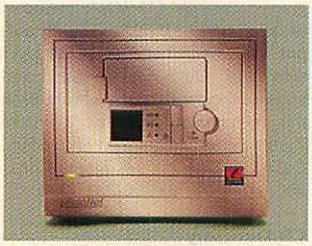
DynaTek's entry into the quad-speed CD-ROM drive market sports a 256K buffer and an average seek time of 125ms. The CDS654 is a caddy-loading, external drive, and ships with an audio-CD software utility. $599. DynaTek Automation Systems, 902/832-3000; fax 902/832-3010.

CTX 2085GM

This 20-inch multifrequency color display is CTX International's most recent addition to the company's line of Energy Star–compliant Green Monitors. The 2085GM features a 0.28mm dot pitch and a maximum resolution of 1600 by 1280 dpi at a 60Hz vertical refresh rate. The monitor has digital controls and comes with 15 factory presets—users can create and save 10 additional settings. $1695. CTX International, 909/595-6146, 800/888-2012; fax 909/595-6293.

DAT Autoloader

Hard drives are fabulous for speed, but for long-term backup you just might want to check out this DDS-2 digital audiotape (DAT) system. The mechanism can handle up to six tapes, providing 48 gigabytes of storage space, and the DAT Autoloader can write data to tape at up to 36MB per minute. The product ships with Dantz's Retrospect Remote backup software. $4495. MicroNet Technology, 714/453-6000; fax 714/453-6001.



DAT Autoloader

EasyCoder 501

This thermal printer prints bar codes on labels, tags, and tickets. The EasyCoder features 300-dpi resolution and can print text, bar codes, and graphics at up to 8 inches per second on stock up to 4.7 inches wide. The printer plugs into the serial port, comes with Macintosh printer-driver software, and is also available with a numeric keypad on the front panel (501E) or with a full alphanumeric keypad (501SA). $2295; 501E $2695; 501SA $3295. DataDesigns, 210/697-0780; fax 210/697-9429.

MicroRouter 900i

With an Ethernet-to-IP router like this one, you could use the Internet as your wide area network. On the IP side, this router supports leased-line, switched-line, and ISDN connections, as well as modem connections over a standard phone line. On the Ethernet side, the MicroRouter 900i has a single port with autoswitching AUI (thick Ethernet), BNC (thin Ethernet), and RJ-45 (10BaseT) connectors. The router ships with Compatible Systems' Macintosh management software; the 900i can also be managed via Telnet. $995. Compatible Systems Corp., 303/444-9532, 800/356-0283; fax 303/444-9595.

MiniMasster

Trading baseball cards is kid stuff—trading PCMCIA cards is where it's at in the nineties. This SCSI PCMCIA reader can handle two Type I or Type II cards or one Type III storage or modem card. Storage cards appear as volumes on the Mac desktop; modem cards require the included communications driver software. Variations of the MiniMasster are also available: the MiniMasster II adds a SyQuest 5¼-inch 200MB removable-cartridge hard drive (one cartridge included) beside the PCMCIA card reader, and the MiniMasster III adds a SyQuest 3½-inch 270MB removable-cartridge hard drive (one cartridge included). MiniMasster internal $632, external $705; MiniMasster II external $1405; MiniMasster III external $1282. Mass Microsystems, 408/956-5999, 800/522-7970; fax 408/956-5995.

MiniMasters

MultiPad 609J

This 6-by-9-inch graphics tablet has a resolution of 2540 lines per inch, is pressure sensitive (256 levels), recognizes 128 levels of pen tilt (plus or minus 60 degrees), and sends data to your Mac at 205 points per second. The tablet uses a cordless pen, both ADB and serial versions are available, and both versions come with configuration software. $269. Hitachi Digital Graphics (USA), 408/747-0777; fax 408/746-2323.

Polaris Drive

Polaris Drives

This line of high-capacity, SCSI-2 hard drives starts at 1GB with the P1000, which features a 9.5ms average access time and a 3.9-MBps sustained data-transfer rate. The P4000 is a 4GB drive with an 8ms average access time and a 4.5-MBps sustained data-transfer rate. Finally, the P9000 is a 9GB drive with an 11.5ms average access time and a 4.6-MBps sustained data-transfer rate. All drives ship with Microtech's DiskForce formatting utility. P1000 $941; P4000 $3499; P9000 $5399. Microtech International, 203/468-6223, 800/626-4276; fax 203/468-6466.

RCD-1000

A CD-ROM recorder, this SCSI device features a 1MB cache buffer and a double-speed write mode. The RCD-1000 can create multisession Photo CDs; can create ISO 9660, HFS, and CD-Image discs; and users can record audio-format discs that can be played on most CD-ROM drives. Each disc holds 680MB of data or 74 minutes of audio. The drive comes with Pinnacle Micro's CD-ROM recording software. $2995. Pinnacle Micro, 714/727-3300, 800/553-7070; fax 714/727-1913.

RS200 and RS270

Who says you can't take it with you? These SCSI-2 removable-cartridge hard drives are both based on SyQuest mechanisms. The 5.25-inch RS200 reads and writes both 44MB and 88MB cartridges, features an average access time of 18ms, and has a sustained data-transfer rate of 1.6 MBps. The 2.5-inch RS270 reads and writes both 105MB and 270MB cartridges, features an average access time of 14ms, and has a sustained data-transfer rate of 1.2 MBps. RS200 $646; RS270 $618. Microtech International, 203/468-6223, 800/626-4276; fax 203/468-6466.

SideWriter KX-P5400M1

This SideWriter model features an AppleTalk interface, so you can share it on the network. The LED (laser technology), PostScript printer prints 300-dpi images at up to 4 pages per minute on 8½-by-11-inch paper. The printer measures 11½ inches high by 5 inches wide by 15 inches deep, and it comes with 2MB of RAM (expandable to 4MB) and 17 Type 1 fonts. $799. Panasonic Communications & Systems, 201/348-7000, 800/742-8086; no fax.

TeamBoard

Whiteboards have become a fixture in the corporate environment; this product draws the whiteboard into the computer age. The TeamBoard is a pressure-

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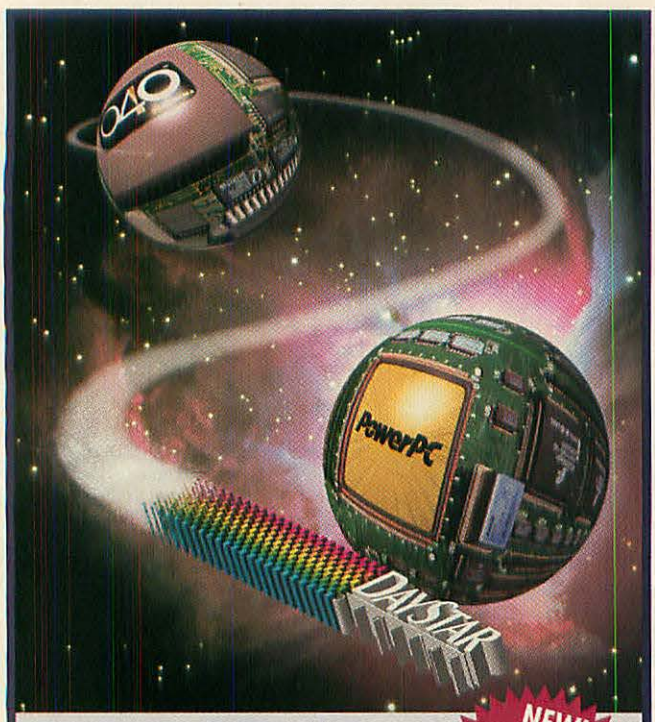
TeamBoard



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SOFTWARE

AfterImage

Based on CoSA's AfterEffects package, this animation, layering, and special-effects software has most of the functions of AfterEffects but is intended for graphic artists and CD-ROM developers who don't require broadcast-quality output. With AfterImage, users can layer stills and QuickTime movies and enhance them with special effects. 8MB min. memory; requires Mac II, System 7; some effects require an FPU. $595. CoSA, a Division of Aldus Corp., 206/628-4526; fax 206/233-7375.

CD Directory

Remember which disc that great picture of the tiger was on? Are you sure? Could you find it in under five minutes? With CD Directory, you can catalog your discs and search them by file name, kind, and label, without mounting any of the volumes. When you find a file, double-click on it and the software tells you where the file is located and on which disc. Requires System 7. $69.95. Insignia Solutions, 415/335-7100, 800/848-7677; fax 415/335-7105.

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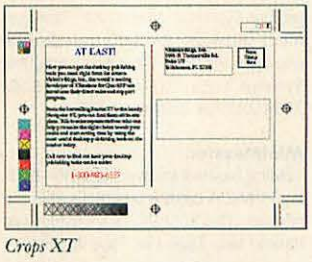


Crops XT

Crops XT

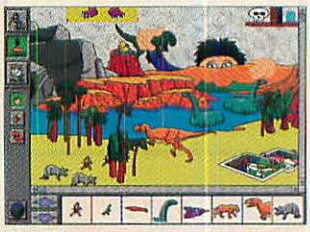
This QuarkXPress XTension automatically adds crop and registration marks to documents. Users can set the size and offset of the marks and choose which marks will be printed, including a color bar, CMYK bar, gray-scale calibration bar, targets, and a CMYK tag. Requires QuarkXPress 3.2. $49. Vision's Edge, 904/386-4573, 800/983-6337; fax 904/386-2594.

Eat My Photons

A self-proclaimed shoot-'em-up, Eat My Photons is designed for folks who want to jump into a game and blow things up. The game features ground and space battles, both fought from a first-person perspective. In either case, you must destroy the deadly drones that are converging on your home base, while enemy fighters try to pound you into smithereens. 4MB min. memory; requires Mac IIci, color, System 7. $59.95. Eccentric Software, 206/628-2687, 800/436-6758; fax 206/628-2681.

File Genie

When you finally get it together, this search utility will help you remember where you put it. File Genie can perform several simultaneous file searches on multiple criteria; users can search by standard file characteristics, and they can search the contents of text files. The software displays found files as it searches, along with complete path information for each one. Once you've found a file, you can open it with the appropriate application or display the file from within File Genie. Requires System 7. $49. Duet Development Corp., 408/559-3838; 800/383-8546; fax 408/559-7117.



Kids World

Kids World

You're not supposed to play with your food, so why not play with your screen saver instead? You (or your kids) start with a standard PICT as a background (several are supplied) and then use stamp tools to place people, animals, plants, buildings, and other objects in a scene. Once the screen has been populated to your artistic satisfaction, click the Go button, and the placed characters become animated, moving around and interacting with each other. Scenes can be saved as UnderWare or After Dark screen-saver modules. Requires Mac LC, System 7. $59.95. Bit Jugglers, 415/968-3908; fax 415/968-5358.

LaserSeps Pro

You can use this Photoshop export filter to create process-color separations without halftone screens. LaserSeps Pro uses a stochastic screening algorithm to reduce moiré patterns, rosettes, and reg-

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LaserSeps Pro

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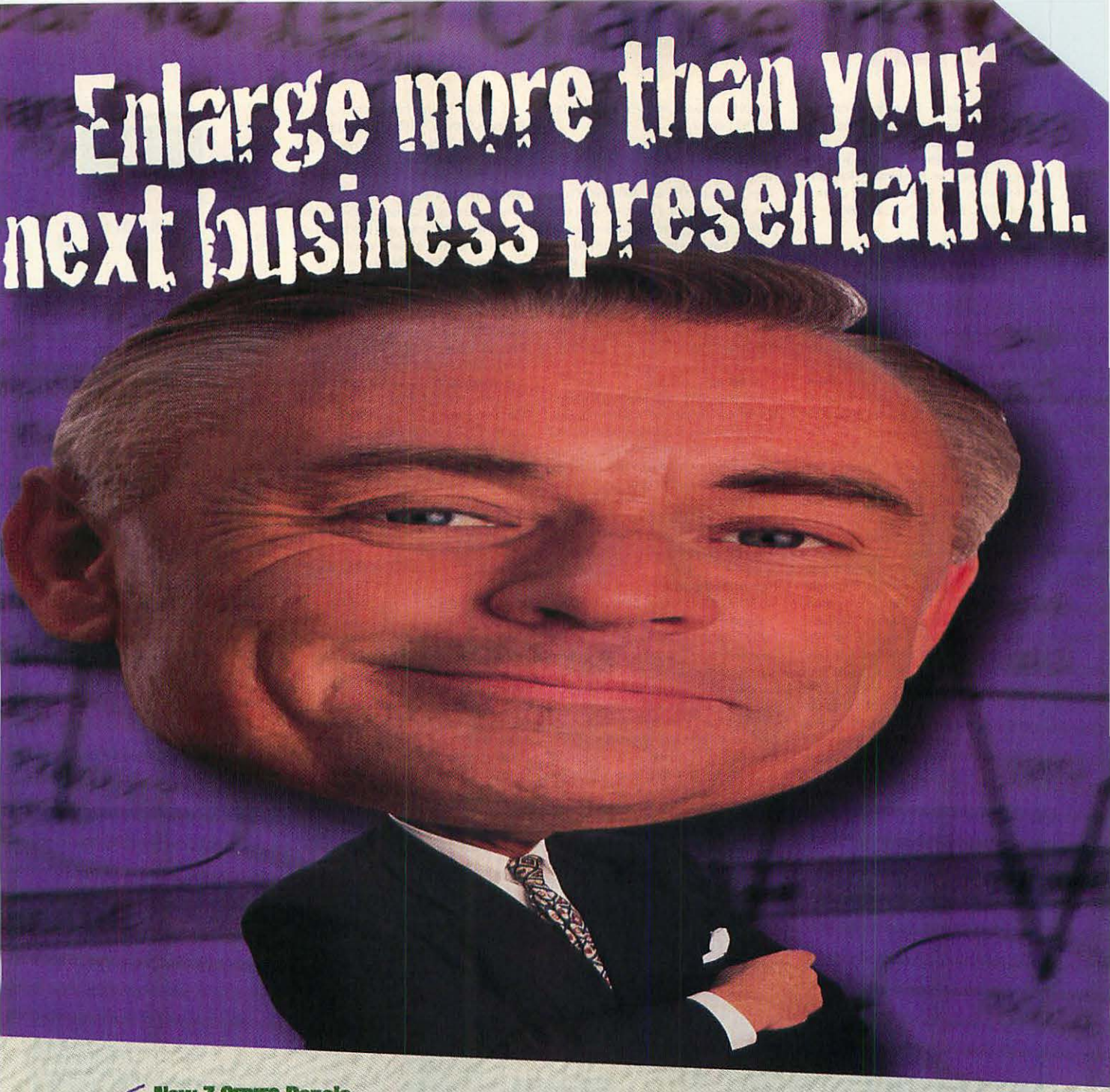

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tion problems. The software can create CMYK sep files in either Photoshop or DCS 2.0 format, and users can fine-tune color cast and tonal range with the filter's Tone Curve interface. Requires Photoshop 2.5. $595. Second Glance, 714/855-2331; fax 714/586-0930.

Lode Runner: The Legend Returns
Race to collect boxes of gold while you avoid the Mad Monks of the Evil Empire in this revitalized arcade-action classic. Sure, you have a laser gun, but it only shoots holes in the rock around you, not in the Mad Monks. Occasionally, you'll find tools to aid you—cannonballs, snares, and befuddling gas—but these will only slow the bad guys down, not take them out completely. A CD-ROM version is available with better-quality sound. 4MB min. memory; requires Mac II. $45.95; CD-ROM $54.95. Sierra On-Line, 206/649-9800, 800/757-7707; fax 206/641-7617.

Out of the Sun
If you think heads-up displays and heat-seeking missles are for sissies, hop in the cockpit of a P-51 or Zero and find out what dogfighting is all about. This flight simulator takes pilots back to World War II, re-creating the huge battles of D-Day, Midway, and Kursk. You can test your skills at nailing destroyers with torpedoes, and dropping bombs on land targets. Or, for the pure at heart, suit up against computer-controlled flyboys for air-to-air combat. 4MB min. memory; requires 68040, System 7. $49.95. Domark Software, 415/513-8929; fax 415/571-0437.

PartialPrints
Need to proof just part of a complex page in QuarkXPress? With this XTension, you can print a specified area of a page, saving time because Quark doesn't have to image the rest of the page; users can save the area as a PICT or EPS graphic file. PartialPrints can also print out just the text you select. Requires QuarkXPress 3.2. $59. Vision's Edge, 904/386-4573, 800/983-6337; fax 904/386-2594.

PegLeg
Board your very own Mach Z Battalion Blaster and (what else?) blast your way through hordes of colorful and noisy bad guys. You get a top-down view of your ship as you carom around the screen like a billiard ball, grabbing power-ups and dodging bouncing drones. 3MB min. memory; requires 8-bit color. $39.95. Changeling Software, 203/623-1963, 800/769-2768; fax 203/654-1661.

Personal Backup
Elephants never forget, but you can bet that someday your Macintosh will. This utility runs in the background, backing up your files to a specified volume, even across a network. Personal Backup can handle incremental and multigenerational backups, as well as simple file synchronization. You can schedule your backups to occur at certain times, and the package includes a keystroke recorder, which copies your keystrokes into a daily file for last-ditch recovery. Requires System 7. $59.95. SunStar Publishing, 203/785-8111, 800/660-4480; fax 203/785-8001.

Rhythm—It's Easy
When you plug this music software into your Macintosh, you get a practice partner that can play either half of the 139 duets contained in the accompanying workbook. The exercises focus on rhythm, covering everything from whole notes and half notes to syncopation in compound meter. The software can shift keys to accommodate different instruments and can play back either through the Macintosh's internal speaker or through an external MIDI device. Requires System 7 to play through Mac speaker. $59.95. LLongs of Newport, 714/640-5664; fax 714/759-9065.

Rhythm—It's Easy

Special Delivery 2.0
The graphic interface of this multimedia authoring package is designed so that users don't have to deal with time lines or scripting while creating presentations. The latest version features better control

Special Delivery 2.0

over embedded QuickTime movies and time-based flags that allow you to trigger several events simultaneously. Version 2.0 also includes ten new transitions. 4MB min. memory; requires Mac II, System 7. $399. Interactive Media Corp., 415/948-0745; no fax.

ZipQuest Pro
If you're running a nationwide business, here's a utility to save you from the simple mistake of calling a client at 5 a.m. Just type in the name of a city recognized by the U.S. Postal Service, and ZipQuest Pro returns the zip code, area code, time zone, local time, and even the approximate distance from your home base. Information updates are available twice yearly. $49.95; single update $24.95; one-year subscription $39.90. Montage Software Systems, 203/834-1144, 800/266-6824; fax 203/762-9601.

CD-ROMS

The Daedalus Encounter
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continues

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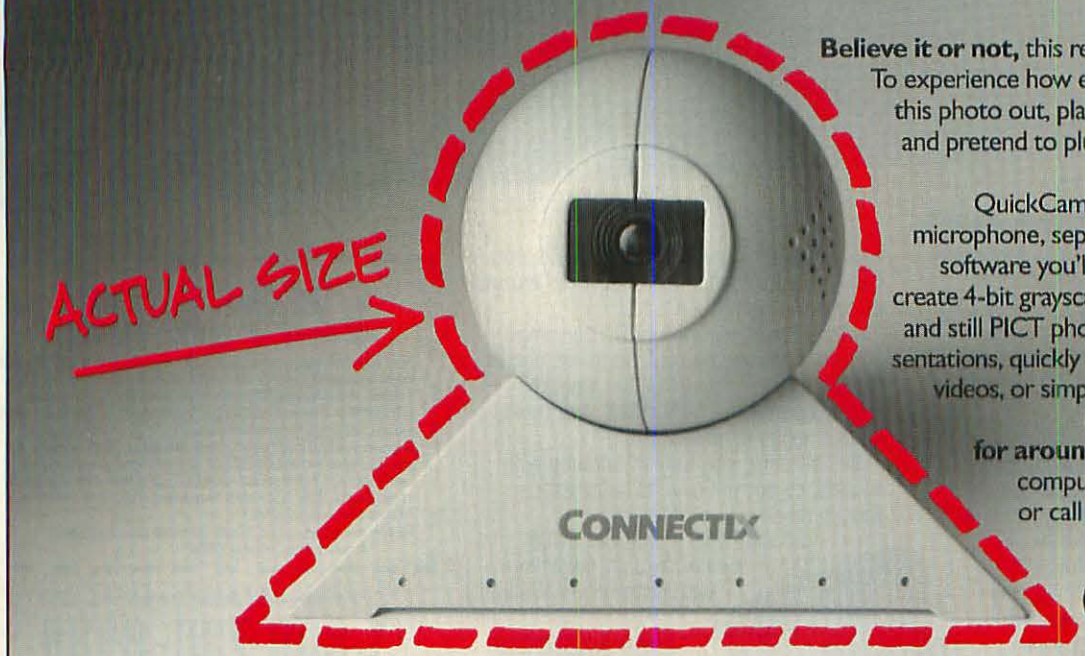

Believe it or not, this really is a video camera. To experience how easy QuickCam™ is, cut this photo out, place atop most any Mac and pretend to plug into the serial port. **That's it.**

QuickCam comes with a built-in microphone, separate base, and all the software you'll need to immediately create 4-bit grayscale QuickTime movies and still PICT photos. Jazz up your presentations, quickly prototype multimedia videos, or simply amaze your friends. **Pick up QuickCam for around $100** wherever fine computer products are sold or call us at (800) 950-5880 x501 toll-free **today.**

QUICKCAM

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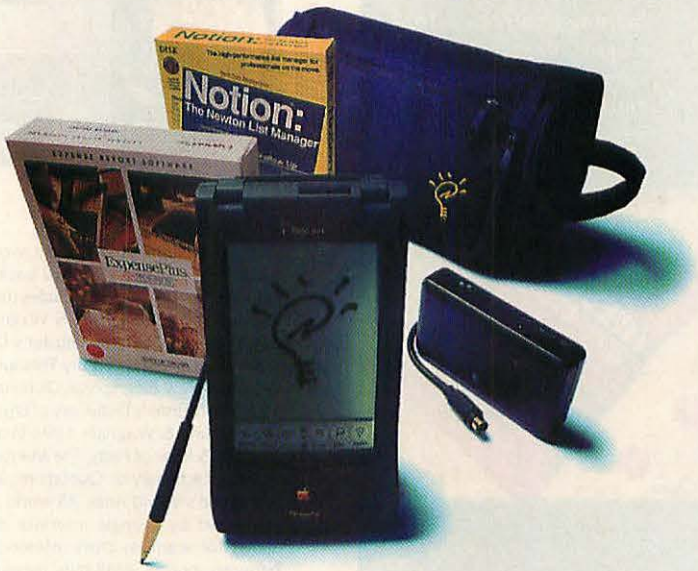
Circle 191 on reader service card

The pack that kept you organized in the '70s.

Contents: 8-track tapes, a comb (for when you had hair), mood ring, history book, your dream journal, three-ring binder, chewing gum, your coolest puka shell necklace.

The pack that will keep you organized in the '90s.



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Newton

Apple

Free Newton Power Organizer Pack when you buy a Newton through December 31.

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former navigator from the Interstellar War whose body was destroyed during battle. Luckily(?), your brain has been salvaged and placed in a mechanical probe. But you are trapped with your old comrades, Ari and Zack (played by Tia Carrere and Christian Bocher, respectively), in an alien vessel on a collision course with the sun, and you are the only person who can save them. This interactive adventure is played out by live actors over digitized backgrounds; and puzzles, decision points, and multiple endings are featured. $79.95. Mechadeus, 415/243-8785; fax 415/243-8630.

Electronic Arts 3D Atlas
A good atlas can make the world your oyster—this one starts with a 3-D, photo-realistic representation of the third planet from the sun (a.k.a. Earth), based on satellite data and statistics. The reference is divided into three parts: the Environmental World, the Physical World, and the Political World. Users can see charts and graphs of the data, and the Atlas also includes video and photographs of events and places on our fair planet. $79.95. Electronic Arts, 415/571-7171, 800/245-4525; fax 415/570-5137.

Electronic Arts 3D Atlas

Infopedia
This compilation of reference works could help you put the *omni* back in *omniscient*. The package includes (on a single disc) the 1994 Funk & Wagnalls Encyclopedia, Merriam-Webster's Dictionary, Roget's 21st Century Thesaurus, Webster's New Biographical Dictionary, Merriam-Webster's Dictionary of English Usage, Funk & Wagnalls 1994 World Almanac & Book of Facts, The Merriam-Webster Dictionary of Quotations, and Hammond's World Atlas. All works are connected by a single interface that allows for seamless cross-referencing between sources. 4MB min. memory; requires Mac IIci, System 7, 13-inch color monitor, double-speed CD-ROM drive. $199.95. InterActive Publishing Corp., 914/426-0400, 800/472-8777; fax 914/426-2606.

Page Overtures Two
This disc contains 100 high-resolution (266-dpi), full-page, photographic background textures in JPEG (PICT) format. Each image is in 24-bit color, and the collection includes screen-resolution versions of the images for placement or for use in multimedia projects. $129. Form and Function, 415/664-4010; fax 415/664-4030.

Video Producer: A Video Production Lab
Intended for anyone who wants to increase their "video literacy," this instructional disc teaches the basic skills

Video Producer: A Video Production Lab

of video production in five areas. The camera section covers both aesthetics and skills such as framing shots and focusing. In the lighting section, students learn how to balance and manipulate lights. The audio section explains how sound equipment works and how sound can set mood and reinforce action. The editing section teaches principles of continuity and how to make a story line flow, while the process section covers pre- and postproduction logistics and issues. 8MB min. memory; requires Mac IIci, System 7, 13-inch monitor, 8-bit color, double-speed CD-ROM drive. $59.95. Wadsworth Publishing, 415/595-2350; no fax.

ACCESSORIES

CyberMaxx
The engineers call it an "immersive stereoscopic environment," and the pundits call it virtual reality. CyberMaxx is a headset that, with the proper software support, splits the video signal coming off your Macintosh and feeds one half to each eye. The set also plugs into your Macintosh's serial port and includes tracking hardware so that when you move your head, the view changes. The final touch: headphones that fit over your ears for stereo sound. The device must be supported from within the application—contact VictorMaxx for a list of compatible software. $799. VictorMaxx Technologies, 708/267-0007, 800/815-6299; fax 708/267-0037.

CyberMaxx

Grip-it Strips
Get a grip. You peel these textured, rubbery, adhesive-backed strips off their paper backing and stick them to your PowerBook. Then, the next time you pick it up, it'll be less likely to slide between your fingers. Grip-it Strips come in black and gray or, for the more adventurous, purple, teal, and magenta. $8.95. Better Hold Products, 415/854-4233; fax 415/854-4253.

Notebook Backpack
If you'd rather have your hands free when you're hauling your PowerBook, then check out this backpack. It's got a compartment with padded external

walls and adjustable internal walls for holding power supplies and such. There's a separate, zippered, paper-storage area, as well as pouches for pens, business cards, and floppy disks. The standard model is made out of Cordura nylon, while the deluxe version is made out of ballistic nylon; a black leather model is also available. $59.95; deluxe $89.95; leather $200. Silicon Sports, 415/327-7900, 800/243-2972; fax 415/327-7962.

Thinking Mouse
Building a better mousetrap has well-documented consequences, but what if you build a better mouse? Kensington's latest attempt has a tapered shape, rubberized sides for easy gripping, and four buttons. The included software features a slew of configuration options; users can customize everything from how fast the cursor responds to the mouse to what action each mouse button performs. You can even create a custom pop-up menu for each application that contains your most-used commands or features. $99.95. Kensington Microware, 415/572-2700, 800/535-4242; fax 415/572-9675.

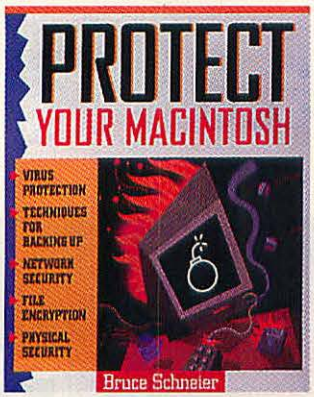
YST-M5 and YST-MSW10
Yamaha's latest additions to its line of computer speakers, the YST-M5 compact powered speakers are magnetically shielded and can handle 3 watts per channel. The YST-MSW10 is a 25-watt, magnetically shielded subwoofer that reproduces frequencies down to 35Hz and works in conjunction with satellite speakers. The subwoofer does not have a power switch; instead, it automatically powers up when it senses a signal and turns itself off after a set amount of time. YST-M5 $99.95; YST-MSW10 $199.99. Yamaha Corp. of America, 714/522-9240, 800/333-4442; fax 714/522-3913.

BOOKS

Fractal Design Painter: Dazzling Digital Art
If a picture is worth a thousand words, make sure yours says exactly what you mean. Author Marvin Bryan leads readers through every aspect of Fractal Design's Painter, covering the drawing and painting tools, brushes, paper textures, special effects, and friskets. Readers also learn about editing photographs and converting black-and-white art into color. 352 pages. $29.95. Windcrest/McGraw-Hill, 717/794-2191, 800/822-8158; fax 717/794-2080.

The Mac Bathroom Reader
Author Owen Linzmayer takes Macintosh enthusiasts on a trip through the anecdotes, myths, and embarrassing quotes that make up the history of the computer for the rest of us. Along the way, readers will discover how Steve Jobs actually tried to kill the Mac project, how Jobs tried to sell Apple (and how Hewlett-Packard, Atari, and Commodore turned him down), and why the 1984 commercial almost never aired. 306 pages. $12.99. Sybex, 510/523-8233, 800/227-2346; fax 510/523-2373.

Macintosh Slick Tricks
There is no simple shortcut to becoming a power user, but in this book, computer consultant and author Maria Langer offers readers the benefits of her Macintosh experience. *Macintosh Slick Tricks* covers timesaving and performance-enhancing techniques from using virtual memory to managing fonts and creating macros, with plenty of keyboard shortcuts and application tips along the way. 288 pages. $16. Random House Electronic Publishing, 212/572-2600, 800/733-3000; fax 212/572-4997.

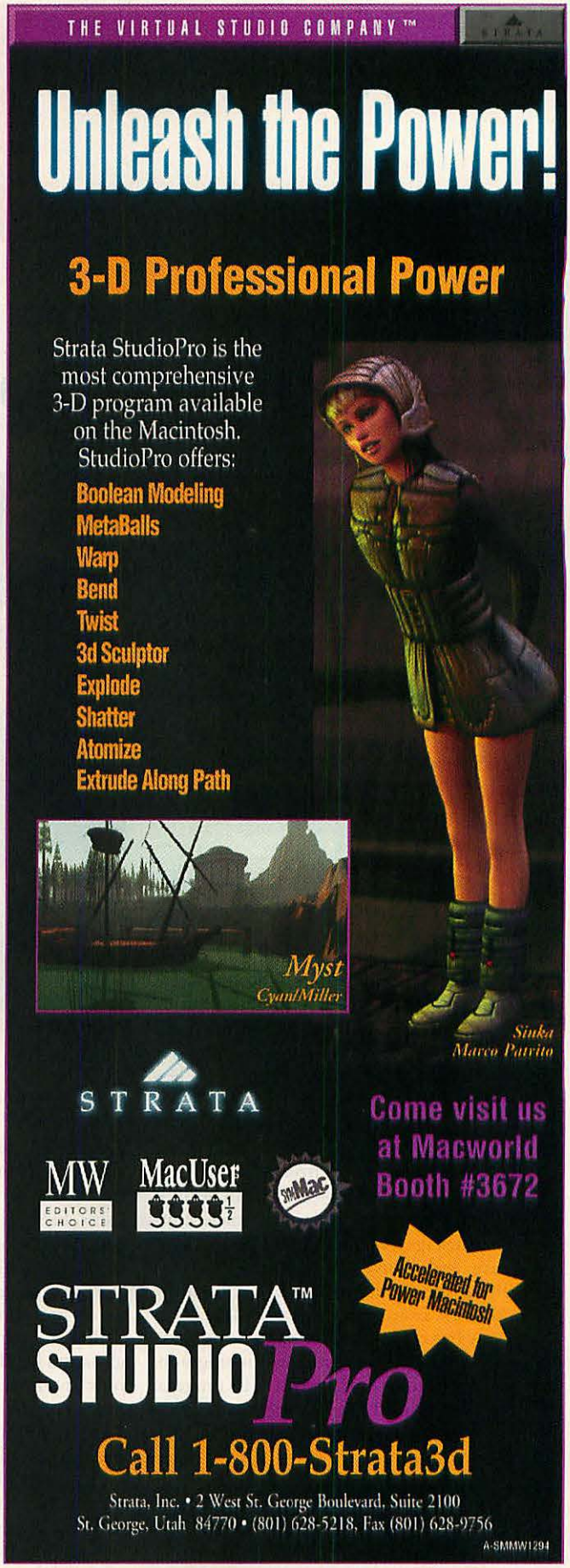


Protect Your Macintosh

Protect Your Macintosh
Whether your Macintosh stands on its own or is part of a network, this book tells you how to protect it without resorting to barbed wire and guard towers. Author Bruce Schneier teaches readers how to deal with physical security, virus protection, software integrity, and disaster recovery. The book includes a list of product sources and the author's opinion on which products are best and why. 336 pages. $23.95. Peachpit Press, 510/548-4393, 800/283-9444; fax 510/548-5991.

Upgrading & Repairing Macs
Written for intermediate to advanced users with varying degrees of experience, *Upgrading & Repairing Macs* provides tips and tricks to help the reader save time and money in selecting and maintaining a Macintosh. The book is divided into six main parts; three sections detail capabilities and upgrade options for Macintosh CPUs and system software, peripherals, and networking/communications products. The other three sections cover preventive maintenance, troubleshooting, and repairing. The book was written by a team of professionals, with Steven Bobker serving as the technical advisor. 1012 pages. $34.99. Que, 317/581-3500, 800/428-5331; fax 317/581-3550. m

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. *Macworld* reserves the right to edit all product announcements.



Circle 116 on reader service card

Adobe Photoshop 3.0

Image-Editing Program

PROS: Can preview most filters and all channel operations; layers provide three levels of masking options; Color Range command lets you adjust the selected area dynamically; can preview CMYK colors without leaving RGB mode; Filter Factory allows you to program custom filters. **CONS:** No JPEG compression for native format; excruciatingly slow to open Photo CD images; requires a fast machine equipped with 16MB of RAM.
COMPANY: Adobe Systems (415/961-4400).
LIST PRICE: $895.

MW ★★★★

JEFF BRICE

FEW APPLICATIONS HAVE ruled the software market as absolutely and as freely as Photoshop. For years, the program was so thoroughly indomitable that one was tempted to take pity on the competition, no matter how incapable. But the sad fact was that more-expensive programs were less powerful, and less-expensive programs were more difficult to use. Photoshop was simply the best.

But Photoshop's iron rule—while it is not yet on the ebb—may be in peril. A handful of new and imminent image-editing packages, including HSC's Live Picture and Fauve's xRes, now threaten Photoshop's domination. Fortunately, Adobe is aware of the threat, and the company has responded with what is certainly the product's most dynamic upgrade. Photoshop 3.0 both broadens its range of capabilities and simplifies the work environment in ways that will actually change how you work.

Try before You Apply

I am going to buck the tide a little and suggest that version 3.0's most important enhancement is its generous supply of previewing options. Considering that the program did not even allow you to preview an image until version 2.5.1, the sheer abundance of filter and compositing previews may surprise longtime users. First on the preview parade are filters. The most commonly used filters provide two helpful previews, one inside the dialog box and one outside. You can zoom and scroll the preview inside the dialog box using the standard magnifying glass and hand tools. But you can also see how an effect will look when applied to the selected area in the image window, thus taking into account such factors in the image mélange as background layers and inactive channels. Though some filtering effects may take too long to make full-size previewing practical—obviously a fast machine and lots of RAM help to speed the process along—there's nothing like it for discovering the inner workings of a complicated filter and testing out variations. If you've always stuck with tried-and-true values when using Unsharp Mask, for example, get ready to invent new ways to apply the filter and recognize new situations in which to use it.

You can also preview channel operations in the main image window. Previously the exclusive domain of experienced professionals and folks who had lots of free time to experiment, channel operations are now available to any user. Better yet, the new version lets you apply many channel operations in tandem. For example, the old Blend and Composite operations—which, respectively, changed image opacity and permitted masking—can now be combined with overlay modes such as Multiply and Screen.

The Layer behind the Mask

If previews allow you to better exploit Photoshop's existing functions, layers permit you to try new things. Although layers inside a bitmapped program are by no means a new invention—Fractal Design Painter X2, Pixel Resources' PixelPaint Pro 3, Specular's Collage, and Live Picture all beat Photoshop to the punch—Adobe's implementation of layers is at once powerful and daunting. Key to layers is the concept of the transparency. Though every layer is as large as the entire image, not all pixels are opaque. Some are translucent and others are flat-out transparent, enabling you to see through to the background layer. In most cases, the rearmost layer is fully opaque. However, you can create a document filled solely with partially transparent layers to serve as a holding cell. (You cannot import a layer into a separate application, such as QuarkXPress or Adobe Illustrator, with transparency intact. You still have to create transparent areas using clipping paths.)

The upshot of this transparency is that every layer acts like a permanently floating selection, complete with anti-aliased or feathered edges. You can draw in the layer to activate new pixels without harming the underlying layers, and you can even smear or blur pixels from one layer into pixels in another. At any time, you can call upon a layer's transparency to mask the layer, meaning that you can limit yourself to changing the colors of opaque pixels only. To reveal underlying layers, you can, of course, erase pixels, but you can also refrain from damaging the layer by creating a layer-specific mask.

Once you come to terms with these techniques—see, I told you it was daunting—you can combine layers into what Adobe calls clipping groups, in which the bottom layer in the group masks the layers above it. Three possible masks for each and every layer—all of which can be in force at once—doesn't make for the most straightforward environment, but it does give you monumental flexibility. No other image-editing package, including Live Picture, provides such a wealth of layering masking options.

To retain all layers in an image, you have to save it in the native Photoshop format. If you want to save an image in TIFF, EPS, JPEG, or some other inter-application format, you have to flatten the image to a single, opaque layer. This technique is par for the course: since no format specifically permits layered pixels, other applications similarly flatten images before exporting them. Still, I wish Adobe had at least offered an option for JPEG compression inside the native format; without it, you may end up with some very large images.

Select, Filter, and Composite I selected an area of color inside the pumpkin's face using the Color Range command (top). I then clicked with the eyedropper tool (highlighted) to specify a base color for the selection. After sending the selection to its own layer, I applied a custom filter created with the Filter Factory to rotate and distort the selected colors (middle). Finally, I composited the layered image with the underlying original pumpkin using the new Overlay option (bottom). All of these steps employ functions new to Photoshop 3.0.

Speed, Selection, and Factory Options

Unlike Photoshop 2.5, which included a single plug-in for accelerating known bottlenecks, version 3.0 has been accelerated for Power Macs from the get-go. On my Power Mac 7100 with a modest 40MB of RAM assigned to Photoshop, the program keeps up with me when editing 20MB and smaller images and begins to lag only as the file size increases. In other words, Photoshop 3.0 tries my patience less than 2.5 did. The only downright slow operation is opening a Photo CD image. Kodak's Photo CD import module is not yet Power Mac–native (but it should be by press time). So opening a 72MB Pro Photo CD image still takes long enough that you can shower, shave, and watch half an episode of "Speed Racer" (close to 40 minutes in laymen's terms). By comparison, opening an image of similar size saved in the native Photoshop format takes less than 2 minutes.

With one exception, Photoshop's selection tools have always been the hallmark by which other image editors are judged. The bad news is that the magic-wand tool in version 3.0 is as rudimentary as ever. The good news is that Adobe has added a Color Range command that builds directly on the tool's capabilities. Like the magic wand, Color Range allows you to click, shift-click, and ⌘-click to define base colors for your selection. Unlike the magic wand, however, Color Range lets you adjust its sensitivity to dynamically modify the size of the selection. Also, the degree of selection changes depending on a color's relationship to the base color, much like a smart feathering option. While I wish this functionality were built into a tool instead of a command, it is nonetheless extremely useful and will no doubt become a hit among intermediate and expert users.

Another feature of the Color Range command (and possibly one of the reasons it's a command instead of a tool) is its ability to select all pixels that are outside the CMYK gamut. This selection capability allows you to adjust the pixels' hue and saturation manually instead of relying on Photoshop's automated corrections. The program also supplies a special sponge tool that you can use for small saturation touch-ups. As an added bonus, Photoshop 3.0 can now preview colors in the CMYK color space while you continue to work inside the RGB mode—an ideal solution for monitoring your progress without permanently sacrificing color data.

I'd be hard put to name my favorite feature in Photoshop 3.0, but I had the most fun with the Filter Factory. Included only on the CD-ROM, this plug-in allows you to program your own filters by applying functions, variables, and operators to the contents of each color channel in an RGB image. You can even manipulate alpha channels and layer transparencies. Though the mere fact that the Filter Factory requires programming will dissuade most users even fair-weather programmers like me will find the vocabulary very compact and manageable. You can make your filters customizable, provide slider bars for users to manipulate, and export the finished product as a fully functioning plug-in filter. Granted, the programming fields need scroll bars, and the slider values ought to reflect the user-specified range (they always run from 0 to 255 no matter how you interpret the data). But for a throwaway that Adobe barely advertises and hides away on the CD-ROM, it's a real treat.

While there's more to like about

continues

Photoshop 3.0 than previous versions, I do have a few complaints to share. Foremost, the program—just the application file itself—takes up 8MB of disk space. And the minimum amount of application RAM required is 10MB, which definitely rules out using the program on 8MB machines and all but the most highly equipped PowerBooks. I wonder why Adobe didn't make layers a separate plug-in that users could jettison under low-memory conditions. If the company hopes to continue to accommodate professional users, Photoshop needs to incorporate the use of proxies. Though HSC still has many wrinkles to iron out of Live Picture, that program is significantly faster than Photoshop when editing high-resolution images.

In the Random Gripes department, let me add that you can no longer selectively drop out colors in a floating selection and force colors from the underlying image using the Composite Controls dialog box; its replacement function applies to layers only, making quick edits more laborious. And Photoshop 3.0 includes at least two minor bugs: applying the Emboss filter to any image with a Height value of 1 and a diagonal Angle value (that is, 45 or 135 degrees) turns the image completely gray, and a special option-key trick for the Apply Image command doesn't work if something inside the target image is selected.

The Last Word

The pros of Photoshop 3.0 far outweigh the cons, however, particularly in light of all the minor additions I've neglected to mention. For example, print-media photographers can now attach captions, credits, copyrights, and other information to their images. You can drag and drop selections between open images, all but eliminating any need for the poky Copy and Paste commands. New overlay modes merge Multiply and Screen to increase your range of compositing options.

If you're looking for some basic fixes, you can finally change the cursor to reflect the brush size, and you can access differently sized, shaped, and softened erasers. And though Photoshop's method for assigning custom keyboard equivalents remains clumsy, convenience functions abound. You can access all tools and toolbox controls from the keyboard, option-click on a channel name to convert it to a selection outline, and select the contents of a layer by pressing ⌘-option-T, just to name a few. So while not perfect, Photoshop 3.0 is easily the most aggressive upgrade to date, a fact I think we can safely lay at the feet of the competition.—DEKE McCLELLAND

Microsoft Excel 5.0

Spreadsheet

PROS: New power features include Pivot Tables and Trendlines; Tip Wizard and Function Wizard. **CONS:** Egregious resource hog. **COMPANY:** Microsoft Corporation (206/882-8080). **COMPANY'S ESTIMATED PRICE:** $339.

MW ★★★★

VERSION 5 OF EXCEL IS here at last! Fork over your money, clean the old files off your hard drive, find a quiet hour or so for installation, and start exploring.

Excel 5, like Microsoft Word, is the product of a design philosophy explained over the years by Microsoft chief software architect Charles Simonyi. The philosophy, crudely paraphrased, is, "We find out what features people want and we program them. We don't optimize or fine-tune unless absolutely necessary, since that takes too long and the chip makers will take care of our performance problems eventually. CPUs get faster and memory gets cheaper, and we want to get products out the door now."

Thus, Microsoft is producing software with stunningly rich feature sets and jaw-dropping resource requirements. The Power Macintosh version of Excel takes nearly 30MB of hard drive space and needs 24MB of RAM to run comfortably (there's not much point running a program on a RISC processor and forcing it to use virtual memory). You can't run Excel 5 at all on a Plus, Classic, or SE (it takes a 68020 processor or higher), and it's very difficult to see how a IIsi, for example, could be upgraded to be a useful Excel 5 box. If you strip System 7 down to its shorts (a bit under 2MB), you can get a minimal Excel to run in 4MB, good news for owners of stock PowerBooks, but you will have only a few K left for files. On a 680X0 Mac, realistically figure on 8MB of RAM and 25MB of free disk space for a happy installation experience.

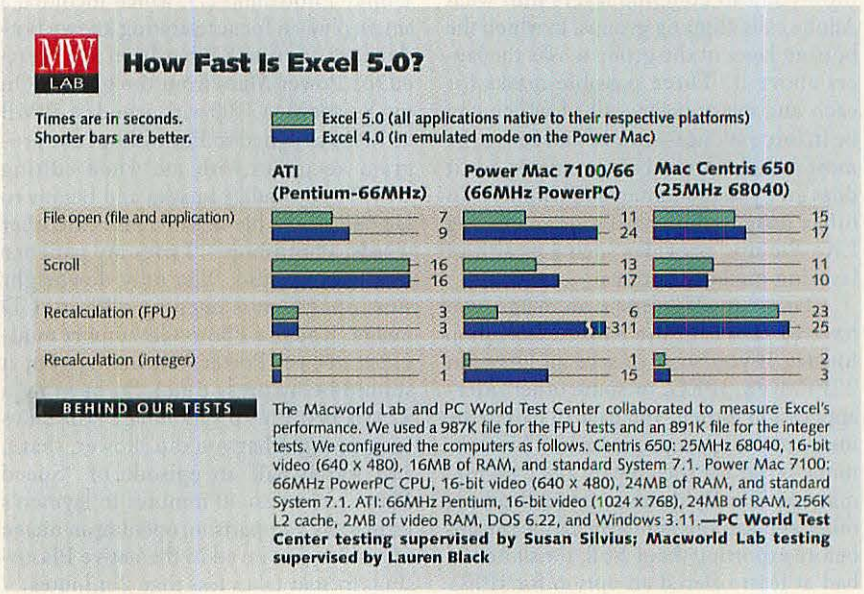
Everything You Could Want

There's a wonderland of new features in all this expanse. Microsoft is delivering the software of tomorrow, but it may need the hardware of tomorrow.

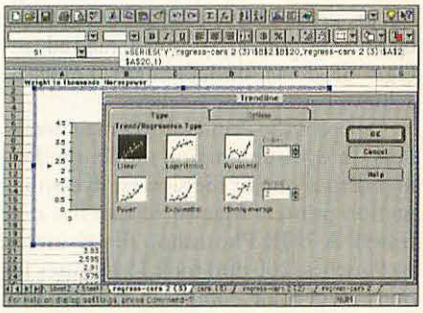
Pivot tables are powerful and nicely implemented. You can take any table of data in which pieces of information are arranged by categories—for example, sales data by Region, by Month, by Product—and make a table in which categories are either row or column labels that you can switch simply by dragging them across the table.

Trendlines are also a shortcut to analytical power. If you select a set of points in an Excel chart (just click on the points), you can pick Trendline from the Insert menu. This gives you options from plain linear regression to data smoothing to complicated curve-fitting—almost the whole range of possible statistical analyses is packaged here as a set of convenient dialog-box choices.

The old Excel macro language is still recognized, somewhat, but Excel macros are now automatically recorded in Micro-



soft's Visual Basic. Version 5 can run version 4 macros, as long as the macros don't look for functions or menu items that have changed. I've run dozens of shareware Excel 4 templates and macros under version 5 with no trouble, but developers with more ambitious programs report loads of problems. Ultimately, developers working with Excel will probably just rewrite their work in Visual Basic. A Visual Basic macro is easy to edit, and the language allows you to write clear programming statements. Because applications in Visual Basic are automatically cross-platform to Windows, and because writing in Visual Basic inside Excel lets you concentrate on functional details and leave the interface details to the environment, you can expect technical- and financial-application add-ins for Excel 5 over the next year.



Trendy Sophisticated regression capabilities are now built into the charting section of Excel.

Finally, the other important new power feature is simply that the default file for Excel 5 is the Workbook, a set of grouped worksheets (you decide the number of worksheets per Workbook). This greatly simplifies constructing three-dimensional data tables (which can also be used in pivot tables) and makes it much easier to organize projects.

The Wizards in this version of Excel are necessities rather than conveniences. The Tip Wizard, a chatty little backseat driver at the top of the screen, points out features you could have used, based on your last selections. The Function Wizard now provides, in effect, a tutorial on functions and the arguments you must enter for the correct results. ToolTips, a sort of balloon help that explains the functions of the vast array of buttons, is available if you pause the cursor over a particular button. Since the feature scope of Excel 5 now fits awkwardly in the traditional Mac dialog box, formatting and settings dialog boxes sport tabs (like the ones on file folders), which group options into easy-to-reach sections.

The shipping version of Excel 5 (compared with the many beta versions) shows acceptable recalc times on 680X0 Macs—the times on a Quadra 610 are remarkably similar to the recalc times, for the same worksheet, for Excel 2.2 on a IIcx (I've been doing this a long time). The Power Mac version on a 6100 with 24MB of RAM performed seven to eight times as fast as the 680X0 version on a Quadra 610. At present, the recalc speed champion on the Power Mac is the spreadsheet in ClarisWorks' Power Mac version, 2.1, which lacks many of Excel's features, but which nonetheless represents a real alternative to Excel, especially for users who bought the standard configuration of 8MB of RAM. In Microsoft's view, tweaking recalc times in seconds is not the issue—getting better-looking reports and better data analysis on a timescale of days is what's important. The main performance complaint arises from sheer bulk—on older machines with slow hard drives, Excel 5's bigger size means start-up times are annoyingly slow.

Why So Big?

Microsoft is testing the philosophical proposition that the only way to make software better is to add features, not to simplify. For example, look at the in-cell editing capabilities ("rich cell editing" in Microsoft-speak). Not only can you resize individual cells to fit any text, but you can edit the text in cells character by character. Each text-containing cell in Excel 5 is for all practical purposes now the equivalent of a page in the original MacWrite—you could use Excel as your word processor for small tasks! Capabilities like this expand code size.

Another reason Excel 5 is big is that many capabilities are implemented inefficiently. The Analysis Tool Pak Add-In, which offers a modest set of statistical routines that work inside Excel, takes 729K as a separate module. In contrast, the *stand-alone* statistics application DataDesk 4 manages to fit a huge range of capabilities, including rotating 3-D graphs, notebooks, and dozens of advanced functions, into 900K. The Tool Pak routines would take about 60K in the hands of DataDesk's programmers. Besides this, there's a terrifying level of redundancy. I counted seven different ways (functions, menu commands, add-in features) to perform the same linear regression analysis.

The Last Word

Excel 5 is a relentlessly complete tool kit for analyzing numbers. That means it's huge, but recalc performance on mid-range and low-end machines is acceptable. Nonetheless, it's the fanciest spreadsheet and the choice for serious business work.—CHARLES SEITER

Power Mac Update

QuarkXPress 3.31

System Requirements 680X0 version: 3MB of RAM; System 6.0.5. Power Mac version: Power Macintosh; System 7.1.2; CD-ROM drive.
List Price $895; upgrade from version 3.3 $225.
Company Quark (303/894-8888).

The long-awaited native Power Macintosh version of QuarkXPress offers users a number of overall performance improvements. While tasks that are CPU-based are fast, Macworld Lab tests show that disk operations and printing are slower when using the Power Macintosh than when using the 680X0 version.

Macworld Lab performed several speed tests using a 611K real-world QuarkXPress file that contained several placed art images and a variety of fonts. We tested the time it took to save the document as a PostScript file, refresh the screen, and print the document. We used a Power Macintosh 7100/66 with 24MB of RAM and a 250MB hard drive for the Power Mac tests, and a Centris 650 with the same configuration for the 680X0 tests.

Both computers were set to display thousands of colors from internal video. The appropriate current versions of Adobe Type Manager were installed on both machines.

MW LAB — QuarkXPress 3.31

	Power Mac 7100/66	Centris 650
Save	34.2	25.9
Print	200.0	185.2
Redraw & Zoom	11.2	30.7

Times to perform operations (in seconds).

The Power Macintosh version's most significant performance advantage is its screen-refresh speed. Moreover, changing fonts in the native version is virtually instantaneous. According to the company, saving a full-page graphic as an EPS file takes longer on the Power Macintosh because of emulation that occurs for I/O operations on Power Macintosh machines. Similarly, printing a file is slower.

QuarkXPress users will find faster redrawing in the Power Mac version, but they'll have to wait for faster system software from Apple for other speed improvements.—JOANNA PEARLSTEIN

PrimeraPro

Thermal-Wax and Dye-Sublimation Printer

PROS: Excellent output for its price range.
CONS: Extremely slow for photo-realistic output; relatively high cost of consumables.
COMPANY: Fargo Electronics (612/941-9470).
LIST PRICE: $1895.

MW ★★★

MW LAB FARGO ELECTRONICS' PRIMERA was the first inexpensive, personal color printer to support both dye-sublimation and thermal-wax printing, but its output was mediocre and it took forever to print. The new PrimeraPro is a vast improvement over its predecessor. It's still slow, but now the printout is worth waiting for.

Like the earlier model, the PrimeraPro uses a single print head for both thermal-wax transfer and dye-sublimation jobs, but the new print head is more sophisticated, with control circuitry that allows it to operate much faster and with greater precision. The page-setup box allows you to specify the type of output you need—three- or four-color thermal wax, black-and-white, or color photo-realistic dye sub.

For photo-realistic output, the PrimeraPro comes with a dye-sublimation kit that includes a ribbon tray and a ribbon good for ten printouts—just enough to whet your appetite. To switch from dye sub to thermal wax for faster printing and typical business color printing, you swap ribbon trays and reload the printer with thermal-wax paper.

Output Improvements

The PrimeraPro's biggest advancement over its less-expensive sibling is in the quality of the dye-sublimation output. The original Primera maxes out at 203 dpi, which is far from desirable. The PrimeraPro features a high-quality mode of 600 dpi by 300 dpi, a regular mode of 300 dpi by 300 dpi, and a draft mode of 72 dpi by 72 dpi. Most of the artifacts associated with the 203-dpi version, such as posterization and banding, are gone. Although on close examination I could see some banding and dithering, particularly in the highlight areas, the PrimeraPro's dye-sub output is far better than that of any ink-jet or thermal-wax printer at this price. The 600-by-300-dpi thermal-wax output is also quite impressive, but the printer's main selling point is definitely its photo-realistic dye-sub capability. To date I have seen no other printer under $2000 that matches it.

During my test runs, I encountered a couple of printer errors (the system couldn't find the printer), but powering the printer off and then on again solved the problem. Fargo's excellent tech-support department should be able to solve any problems you run into and quickly get you going again.

Mission Critical

Fargo promotes the printer for proofing, so Macworld Lab looked at the different color-correction schemes that came with the printer to see how closely colors on a film proof matched those on the monitor. If your only concern is to match your output colors with the colors you see on the monitor, Fargo's gamma-correction scheme or FargoMatch (the company's proprietary color-matching scheme) will handle the job properly. The printouts' colors, however, were less saturated than those of the film proof. Tinkering with the settings in the dialog box didn't get the printout to match correctly. If your color-matching needs are critical, consider the far more expensive ($8000) SuperMac ProofPositive with the EFI color-management scheme. The PrimeraPro's PostScript Level 2 option (a must if you print from graphics and layout programs), which should be available by the time you read this, will take advantage of device-independent color to achieve better color fidelity.

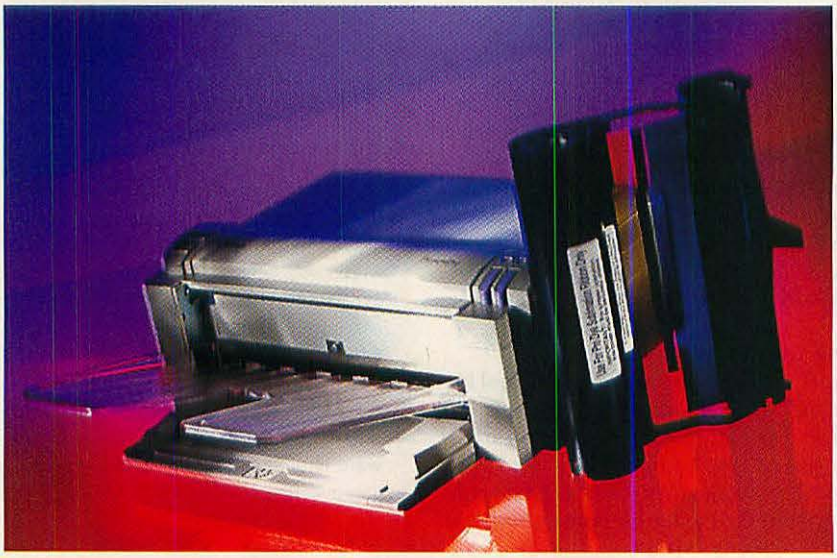
Speed is the PrimeraPro's main weakness. In dye-sublimation mode, the PrimeraPro is one of the slowest dye-sublimation printers Macworld Lab has ever tested. A 7MB Photoshop file (6 inches by 9 inches, 200 dpi) took 15 minutes for one pass of color, compared with less than 7 minutes on a Tektronix Phaser IISDX. Also, since all the rasterization takes place on the Mac, print speed depends on your CPU. Fargo recommends a minimum system of a Centris with 8MB of RAM and 20MB of hard drive space. (Unfortunately, a Power Mac won't help until Fargo writes native drivers.) Fargo expects to have an Adobe Photoshop export module early next year, which should cut the printing time down by at least a third.

On the other hand, the PrimeraPro is one of the fastest thermal-wax printers Macworld Lab has tested. In thermal-wax mode the same 7MB Photoshop file took only about 4 minutes to print. However, my Lab coworkers were annoyed to learn that this small printer is as noisy as a printer two to three times its size.

As with owning a Polaroid instant camera, most of your expenditures go to consumables. An 8½-by-11-inch printout costs about $2.50—a lot for a printer of this price and capability. Thermal-wax printing is a lot cheaper—around 40 to 45 cents, depending on paper quality. If you print many iterations before making a decision, it's faster and more economical to hold off on a dye-sub printout till you're sure. Other options from Fargo: an iron-on-transfer kit and a 4-by-5-inch glossy photographic paper stock that, at 90 cents per print, produces output worthy of your photo album.

The Last Word

Having two print technologies available from a single printer is handy, and the PrimeraPro's photo-realistic output definitely beats that of any other printer in this price range. But with the higher-cost consumables and the slow print time, the PrimeraPro is best suited for routine thermal-wax use and occasional dye-sub work.—MARK HURLOW



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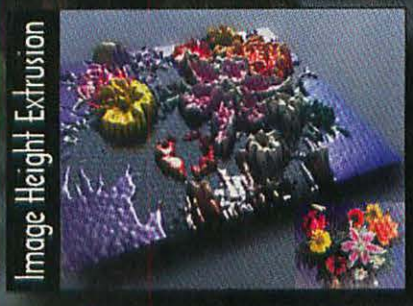

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QuickMail 3.0

Electronic Mail

PROS: Easy to set up and use; good documentation. **CONS:** Some security concerns for server; rules-based messaging lacks certain functions. **COMPANY:** CE Software (515/221-1801). **LIST PRICE:** 1 user $199, 5 users $449, 10 users $649, 25 users $1449, 50 users $2549, 100 users $3799; site licenses available.

MW ★★★

MW LAB ELECTRONIC MAIL HAS BECOME an indispensable tool for organizing, communicating, and collaborating with coworkers. CE Software's recently updated QuickMail delivers an intuitive, easy-to-use interface as well as solid administrative options for network managers. Version 3.0 provides some new client tools; but the most promising of these tools, rules-based message handling, lacks some important features and that cripples its abilities.

Like many E-mail applications, QuickMail comes in two parts: client and administration software. The client software resides on the local user's computer, while the administration, or server, software runs on a centralized Mac. QuickMail comes with client software for Mac, DOS, and Windows as well as remote client software for Macintosh users (Remote Windows and DOS clients can use any communications package).

The QuickMail experience begins with installing the server software on a suitable Mac. The server software can reside on as lowly a Mac as an SE and can coexist with an AppleShare file server. Installation of the server involves popping in a couple of disks, rebooting the server, and creating a MailCenter.

MailCenters are the heart of every QuickMail server. They're basically the post offices created for a group of users. A MailCenter can also act as a gateway to collect and deliver mail between other QuickMail servers and online services. QuickMail includes scripts for connecting to CompuServe, MCI, AppleLink, and Delphi. Third parties, such as StarNine (510/649-4949), sell QuickMail gateways that provide access to other services, including the Internet. Creating a MailCenter is an easy task that involves plugging in user names and passwords. A gateway MailCenter requires additional information for such connection terms as baud rate, type of file transfer, and phone numbers. Once the server software has been installed, the QuickMail client software must be installed on all client computers. The minimum configuration for a Mac client is a Plus; for a DOS client, it's an 8088; and for Windows clients, a 386 is the slowest processor allowed.

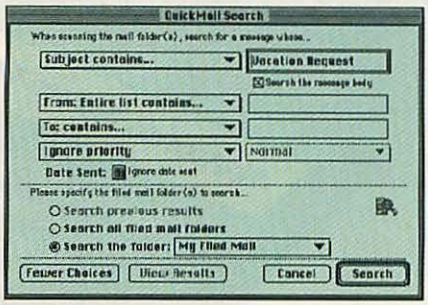
In addition to providing basic mail-handling options (send messages; attach enclosures; and receive, print, file, and save E-mail), the QuickMail client lets you establish online chats, check the spelling of messages, search through message text, and create rules to automatically handle routine mail.

QuickConference, also available in previous versions, lets you establish online chats with other QuickMail users. I found it most useful when I was on the phone and needed information for the phone call from someone in the office.

The spelling checker provides the type of basic verification in most word processing applications. I surveyed several QuickMail users who thought it was a great addition and used it regularly.

The text-search function works with all locally filed messages. It cannot search new mail or mail that resides on the QuickMail server. Search criteria can include information in any mail-address field as well as message contents. After a search is complete, the found messages can be viewed in the search window or opened for full view. I was disappointed that CE didn't include the ability to use drag and drop so that I could move the contents of found messages onto the desktop or into a new E-mail message.

Rules-based message handling is the most promising feature of QuickMail 3.0. Rules allow you to automate certain actions. For example, QuickMail can automatically file all received messages containing the word *Deadline* in the subject field, to a folder called Urgent Mail-Read Now, and then delete the message from the in-box. In addition to filing messages, you can automatically print, reply to, delete, and forward messages. One of my first experiences using the Rules feature required the use of Boolean search criteria. Unfortunately, QuickMail 3.0's limited Boolean search functions preclude the use of an OR statement. Consequently, I had to set up two rules, which means that if a message contains both search triggers, QuickMail will process the message twice. According to CE's technical support, that was the only way to accomplish my search. The tech-support staff acknowledged that other users were requesting the same capability.



Search and Seizure Users can now search high and low through filed messages to find that mission-critical piece of electronic mail.

Two utility applications are also included with QuickMail—QuickMail Remote and QuickMail Forms; neither application was updated in the current version. QuickMail Remote allows users to attach to the QuickMail server remotely. This application has not been updated in quite some time; it is not intuitive and requires a host of communications configurations. Most large sites using QuickMail have adopted a workaround using Apple Remote Access and a local QuickMail client.

QuickMail Forms enables you to customize your electronic-mail forms to accommodate the personalities of your office and the people who work there. QuickMail currently supports only MacPaint format and does not work with multiple forms simultaneously. Many users I surveyed would like to have additional features.

QuickMail 3.0 has built security features into the client and server software. Passwords are required for almost every modification of an existing MailCenter. QuickMail clients can restrict access to their account by requiring a password each time the application is opened. Crafty snoops can still read anyone's unfiled E-mail by sorting through the QuickMail server and locating the correct files, however. I strongly recommend that QuickMail servers have no keyboard or monitor attached and that administrators use Timbuktu Pro to administer the servers remotely.

The Last Word

If you're shopping for a first-time E-mail application, QuickMail is a good choice. What it lacks in flashy extra features it makes up for in ease of use and setup. The documentation is well written and easy to understand. If you are currently using QuickMail, I suggest waiting for the next revision before upgrading. With 3.0 you're basically purchasing the spelling checker, text-search capability, and an unfinished attempt at rules-based messaging.—MATT CLARK

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Claris Organizer

Personal Information Manager

PROS: Excellent integration; good intelligent assistance. **CONS:** Some printing problems; no menu-bar access. **COMPANY:** Claris Corporation (408/727-8227). **LIST PRICE:** $99.

MW ★★★

ENTERING A FIELD AS CROWDED AS the personal information manager (PIM) market requires a great deal of confidence on Claris's part. On the one hand, there are already many competitors, some long established, such as Adobe's TouchBase Pro and DateBook Pro, Now Software's Now Up-to-Date and Now Contact, and Portfolio Software's Day-to-Day package (formerly Dynodex). On the other hand, Claris has had the opportunity to build on the features of these programs; Claris Organizer is a remarkably polished first release.

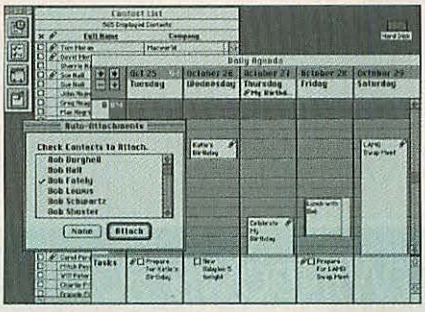
Organizer is an all-in-one PIM that includes modules for Calendar, Contacts, Tasks, and Notes. The program has a floating button palette that lets you access each module's window. Organizer is a single-user product; it can't be opened and shared by multiple simultaneous users, as can Now Up-to-Date and TouchBase Pro. Claris Organizer gets by with only 1.2MB of RAM, despite being a RAM-based program. Because the data is in RAM, performance is good. Sorts and searches occur almost immediately.

Organizer's Calendar module provides separate Weekly, Monthly, and Daily Agenda views, as well as a Navigator window that enables you to quickly jump to any past or future date. Each view has arrow buttons that let you move forward or backward in time; in addition, the Daily and Weekly views have plus and minus buttons that control how many days or weeks you can view at one time. The Daily view window is split horizontally into two panes. The top pane shows your appointments, and the bottom pane displays the day's tasks. The Monthly view, unfortunately, doesn't allow you to create banners that span several days, for denoting business trips or other longer events. You can drag events to move them between days, but you can't option-drag events to copy them from one day to another.

The other three modules—Contacts, Tasks, and Notes—can each display a list view and an individual detail window. Each contact record can handle two sets of addresses, four telephone numbers, and four customizable fields. Tasks (what some programs call to-dos) have five priority levels and, like appointments, can be onetime or recurring. You can also set alarms for tasks or appointments.

The feature that sets Claris Organizer apart from most other personal information managers is its intelligent assistance. Like some programs, Organizer has several data entry aids for entering contacts. The program has pop-up menus with common entries for most fields, such as Title, State, and phone labels. It also automatically completes a field based on the first few keystrokes.

Claris Organizer has the ability to attach any item to any other item. It's easy to attach a contact to an event, or a note to a contact. Items with attachments have a small paper-clip icon next to them. Clicking on the paper clip displays a pop-up menu with a list of the attachments. Of the several ways to attach items, the best is drag and drop. It's simple to associate coworkers with a meeting: just drag the coworkers' names from the contact list onto the appointment in your calendar. Once you attach people to an event, it's a snap to contact any of them. You can also drag items to any of the module buttons in the palette. These items are intelligently named, so that, for example, if you drag an appointment called "Breakfast Meeting" onto the Note button in the palette, you get a new attached Note named "Note regarding Breakfast Meeting." If you drag Bob's name from the contact list onto the Task button, you create a "Call Bob" task.



Getting Attached Organizer's Auto-Attachments feature is connecting one of the Bobs in the list to the "Lunch with Bob" appointment.

Claris Organizer's assistance really shines with its Auto-Attachments feature. If you enter "Dinner with Bob," the program attaches Bob to the appointment. If your contact list has more than one person named Bob, Organizer pops up a list of all the Bobs, and you choose which one to attach.

Viewing and sorting information in Claris Organizer is adequate but could be improved. You can easily select a list of contacts within a particular category, but there's no simple way to select all contacts *except* that category, or to select and mark contacts in one step. You can sort on only two fields at a time and only in ascending order.

Claris Organizer lacks a feature found in most of its more recent rivals: an extension that allows quick menu-bar access to Organizer from within all other programs. Now Contact's QuickContact pioneered this idea, and it was followed by the Adobe and Portfolio products. Such easy, universal access to your contacts and calendar is becoming an expected standard for PIMs, and I hope that Claris Organizer will add this feature in the next revision.

The Organizer manual, which consists mainly of a tutorial, is surprisingly skimpy and even lacks an index. The online help included with the program is considerably more detailed and useful.

Claris Organizer does a good job of printing lists or the detail information from all modules, and it can print envelopes, fax cover sheets, and labels. The program comes with several Avery-label templates and lets you specify a start location when printing labels, so that you can reuse partially used label sheets. Contacts and calendars can be printed (double-sided, if desired) in several day-planner formats, but some are less useful than others. The compact day-planner size (4.25 by 6.75 inches, used by Filofax, Day Runner, and others) prints poorly; the printed address-book and calendar pages are a bit too big and print two across a sheet of letter-size paper. Other programs size their pages correctly and fit three compact day-planner pages on each 8.5-by-11-inch sheet.

The Last Word

With the excellent integration of the four modules and the program's intelligent assistance, Claris Organizer is a worthy competitor in the PIM market. In its first release, it lacks some features that other products boast, but none of these are egregious omissions. In its present version, Organizer won't tempt most long-time PIM users to switch. But new PIM users, lured by the low price, good performance, and ease of use, will probably find that Organizer meets their requirements. With such a strong foundation, Claris Organizer just needs to grow up a bit in the next version to become a major player.—TOM NEGRINO

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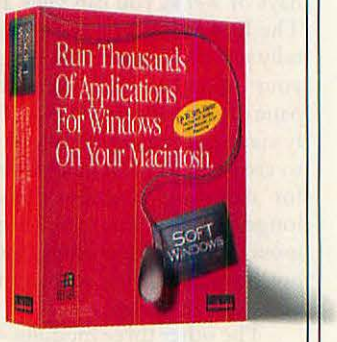

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Circle 68 on reader service card

Microsoft Works 4.0

Integrated Software

PROS: Inexpensive; good word processing and drawing tools; includes calendar and address-book components. **CONS:** Weak spreadsheet and database modules; can't format tables in word processor. **COMPANY:** Microsoft Corporation (206/882-8080). **COMPANY'S ESTIMATED PRICE:** $99.95.

MW ★★★

AT LAST, AFTER A SERIOUS UPdate, Microsoft Works is starting to look the way it should. With the release of version 4.0, what was a poorly designed, overpriced integrated works program becomes a sensible, low-cost package. It provides entry-level users with a respectable word processor, database, and spreadsheet, along with drawing and communications tools, for under $100.

And, while trimming the price, Microsoft has enhanced Works 4.0 with plenty of new features, including a built-in calendar, an address book, and a slide-show module—features missing in many other all-in-one works packages.

New and Improved

All of the existing Works modules have been improved, some dramatically. The word processor is most noticeably made over, acquiring a fast, efficient spelling checker, a thesaurus, and a straightforward table-making tool. A zoom command has been added so you can view a page layout at magnifications of 25 percent to 800 percent. A new tool bar makes formatting commands available via pop-up menus. There's also more assistance online. The WorksWizards, for example, provide step-by-step guidance for creating items such as greeting cards, certificates, and newsletters in a variety of styles. The program also ships with a folderful of AutoStart Stationery templates for new documents.

These features make the Works word processor much easier to use, but it's still a very basic word processor at best. For example, you can add bullets to a series of paragraphs with a single click, but you can't customize the type of bullets used. You can insert a table into a document, but you can't change the color and width of grid lines or shade the table cells. And the module also contains a few odd inconsistencies. Drag-and-drop text editing, supported in the word processor, inexplicably doesn't work within tables.

The program's drawing and painting modules have taken a substantial leap forward. You can draw objects using a variety of shape tools, apply gradient fills, and rotate objects at any angle. You can enhance paint objects with a number of interesting effects, such as blur, emboss, and trace edges. These image-processing commands let you do some creative manipulation of original or imported images within Works. Another little Works bonus: the drawing tools can be used to create PowerPoint-like slide shows. The slide-show–setup features are bare-bones but fine for assembling simple on-screen presentations, albeit without any transitional effects.

The graphics tools are accessible on a floating tool palette from any of the modules, making it easy to integrate draw and paint objects. You can drop logos, charts, or diagrams onto a page and then use the straightforward text-wrap commands to make the text either wrap around the graphic elements or overlap them. For more elaborate layouts, you can set text in individual text frames within a page (and across pages) and build links between frames as you would with a full-blown page-layout program.

Off to See the Wizard WorksWizards automate steps for creating popular items like cards, certificates, and newsletters, as shown here. Answer the Wizard's questions and Works sets up a new document formatted to your specifications.

Subtle Changes

The database and spreadsheet modules are less improved, though they too have been upgraded. The database allows you to create multiple data-entry and -display forms, along with a fully customizable list view. A new field-placement dialog box simplifies setting up new forms, and the reporting capabilities are improved. You still have to enter data into each field through an entry bar at the top of the screen, spreadsheet-style, instead of directly in the field. And the zoom tool accessible in the word processor can't be used when designing a database.

The spreadsheet also still lacks a zoom function, so you can't reduce a large spreadsheet to get an overview of your work. Also, the spreadsheet-formatting commands are oddly implemented. If you select a cell and pick a different font, the entire spreadsheet changes to the new font. But if you pick a new color or style, the change affects only the selected cell.

On the positive side, the spreadsheet supports a full range of standard functions and integrates nicely with the other modules in the program. For example, the Paste Special command makes it easy to embed a spreadsheet into a word processing document. Double-clicking on the embedded spreadsheet gives you instant access to the spreadsheet tools so you can edit the spreadsheet from within the word processing document.

The Works telecommunications module is probably the least likely to be used—true for all works programs—but it, too, is enhanced. The module now supports a fuller range of file-transfer protocols, including Xmodem, Ymodem, Zmodem. Other notable features include a status area that lets you display the date, time, and duration of a telecom session, or your online service charges; macros to automate dial-up and log-in sequences; and an option for preselecting an application to open downloaded text files.

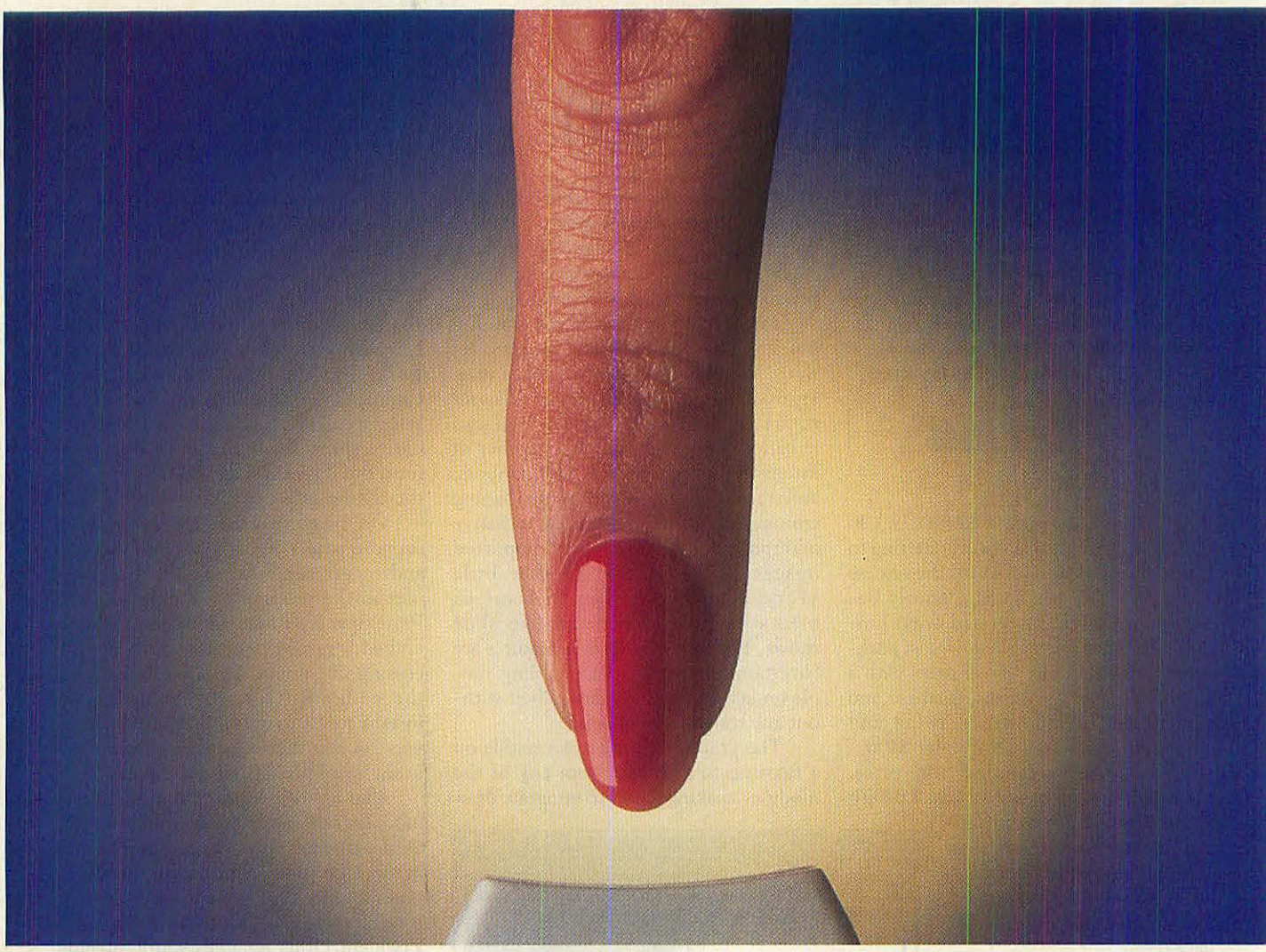
In addition to the traditional works modules, Works 4.0 now includes its own calendar and address book. There's not much to the address book, just a database preset with the appropriate customizable fields for address listings. The calendar is nicer, a simple but useful planner/organizer. It displays daily, monthly, and weekly views of your appointments, along with a list view for to-do items.

The Last Word

Despite all the forward steps, Microsoft Works 4.0 isn't the best integrated software package around; ClarisWorks still offers stronger individual tools and the best overall selection of features—though it costs about $100 more on the street and lacks a calendar program. But Microsoft Works offers so much at such a good price that it merits serious consideration. Entry-level users looking for an all-in-one package at the best possible price won't be disappointed with Works 4.0.

—JOSEPH SCHORR

Anderson & Lembke, Inc.



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Circle 158 on reader service card

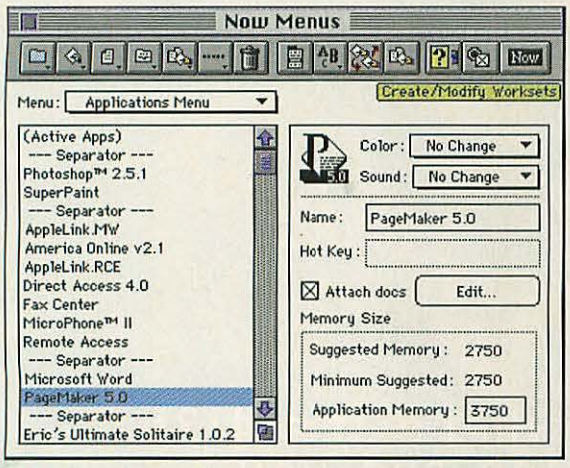
Now Utilities 5.0

Utilities Collection

PROS: Comprehensive, well-integrated collection of system utilities; excellent value. **CONS:** Inconsistent use of System 7.5's new features. **COMPANY:** Now Software (503/274-2800). **COMPANY'S ESTIMATED PRICE:** $89.

MW ★★★★

MANY—MYSELF INCLUDED—consider Now Utilities 4.0 the best Macintosh system utility collection around, and version 5.0 proves that Now Software has not been resting on its laurels. The most noticeable improvement to this version is the addition of two modules, Now FolderMenus and Now QuickFiler. Now FolderMenus adds a pop-up menu of a folder's contents to every folder in the Finder. Apparently inspired by Inline Software's PopupFolder, Now FolderMenus is equally handy, seems faster, and has a few additional and helpful options that PopupFolder lacks.



Making a Menu In the Now Menus Menu Editor, yellow pop-up–button legends explain the function of each button in the button bar. The button under the pointer here, for example, allows you to create work sets containing related applications and documents.

Now QuickFiler provides an alternate view of your disks, folders, and files in which you can perform all standard file-management functions. It also has a sophisticated Find command and can compress files on demand or in the background. Although Now QuickFiler performs these tasks adequately, anyone looking specifically for file management will probably find DiskTop (PrairieSoft) easier to use, and if you're serious about file compression, you would do better with StuffIt Deluxe (Aladdin Systems) or DiskDoubler Pro (Symantec).

All of version 4's seven modules have been updated for version 5. Two modules—Now Menus and Now Startup Manager—have been improved significantly. In Now Menus, you can now create any number of menu-bar menus (in addition to unlimited pop-up menus) and give each one a unique and colorful menu icon. The smart menu items (recent folders, recent files, and the like) are also smarter, and you can rename the items in a Now menu for easier identification. Now Startup Manager has added start-up–document conflict resolution and control over more types of start-up documents, to the point where it is a viable alternative to Conflict Catcher II (Casady & Greene), the best extensions manager around.

The other modules from version 4 all have a new look and a better design and are, on the whole, easier to use. Now Profile has been updated to recognize Power Mac and System 7.5 features and can E-mail its system description using PowerTalk. Now Scrapbook supports GIF and JPEG graphic formats. Now SuperBoomerang, Now WYSIWYG Menus, and Now Save display only minor changes aside from the new design.

All Now Utilities modules run in native mode on a Power Macintosh, but only some of them take advantage of System 7.5's new features; you cannot add items to Now Scrapbook by means of drag and drop, for example, although you can, oddly enough, in NowMenus' edit window (and in Apple's Scrapbook). Most of the modules follow the latest trend and sport easy-to-use button bars.

The Last Word

Over the course of five software generations, Now Utilities has evolved into a fine-tuned, interlocking set of Finder enhancements. Three of its modules—Now FolderMenus, Now Menus, and Now SuperBoomerang—are almost indispensable, and while the other six may not be tops in their category, they are well worth considering. As a collection, Now Utilities 5.0 remains the best in the business and is an excellent investment for almost any Macintosh owner.

—ROBERT C. ECKHARDT

Cal 1.0

Calculator and Calendar

PROS: Powerful calculator; great voice input (on PlainTalk-capable Macs) and output (on all Macs). **CONS:** Limited printing options; no control over type size in datebook. **COMPANY:** Thought I Could (212/673 9724). **LIST PRICE:** $79.95.

MW ★★★★

CAL IS A WELL-CHOSEN SET OF desktop necessities: an excellent calculator, an associated-formula editor, a datebook, and a calendar that works closely with the datebook.

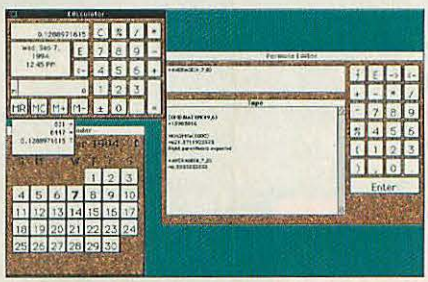
All the elements of Cal are easily accessible from any application, with just a mouse-click and a key-press. Both the calculator and the formula editor create tapes that can be saved. The calculator is nicely designed, and any function you might think is missing is probably already in the formula editor, or creatable there. The calculator and formula editor audibly verify entries and speak results. With a PlainTalk-capable Mac, you can use the calculator and editor by speaking to Cal.

The datebook and calendar let you schedule appointments, events, and multiday events (via banners). You can set any item to repeat at intervals. Visual and audible reminders alert you in advance of events. The only problems are of omission. In a program otherwise totally customizable, you're locked into a small type size for event details. And there's no way to prioritize entries.

Printing options are limited but adequate. If you install all of Cal's options you'll need 3.7MB of hard disk space, but by trimming to the essentials you can reduce the used space to under 2MB.

The Last Word

With Cal's easy access and ample power, it has become an everyday tool for me. And if you have PlainTalk, Cal works even better.—STEVEN BOBKER



Customizable Power The cork background is one of more than 65 attractive options provided.

There's the one where your ex-girlfriend turns into a rabid dingo and chases you and you keep getting your feet stuck in some weird mucky stuff until finally you reach a cliff above a river and as you jump you see her mother waiting for you below.

holding a weed-whacker.

Then there's the one where it's 4:30 the day before your vacation and you accidently hit the delete button as you attempt to print the 46-page update you were supposed to show your boss at 5:00.

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InfoDepot 2.0

Project-Planning Software

PROS: Comprehensive AppleScript support; can share documents over network; good forms-construction capabilities; tables can store many data types, including movies and sound. **CONS:** Can display only one view at a time; nonstandard interface and jargon for some items; cannot convert chalkboard items to a structured outline. **COMPANY:** Chena Software (610/770-1210). **LIST PRICE:** $295.

MW ★★★

INFODEPOT, A REVAMPED VERSION OF Chena's Fair Witness, was designed as an all-in-one program for project planning. InfoDepot includes tools for brainstorming and organizing ideas (the Outline and Chalkboard views); for scheduling project steps (the Timeline view); and for entering, calculating, and presenting data (the Table and Form views). And if InfoDepot doesn't have the built-in capability you need—graphing data, for instance—you can use the program's excellent AppleScript support to import what you create in other programs and store the final results in InfoDepot's tables or forms.

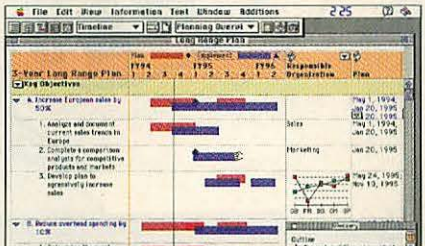
InfoDepot's default starting point is the Outline view, which resembles outlining modules found in programs, such as Attain Corporation's In Control and Inspiration Software's Inspiration, but with more options to customize an outline's appearance. For instance, you can hide individual items in your outline, or you can display only one subheading and its related items by dragging the subheading to replace the outline's main heading at the top of the window. A pop-up menu next to the heading lets you return to other levels of the outline.

InfoDepot's Table view converts each entry in the outline to a row and resembles In Control's outline format, which lets you define columns for data, such as start and finish dates, costs, and people. The Table view functions as a worksheet, since you can add formulas as well as AppleScripts to manipulate the data in a table column or in a single cell. Cells can store text, formulas, graphics, QuickTime movies, AppleScripts, and sounds. Cells can also store multiple values, so you can enter different comments in the same cell and then flip through them by clicking on a page button in the cell.

Just as with the Outline view, you can drag a subheading to replace the main heading in the Table view. For example, your project outline might have separate subheadings for the sales, marketing, and engineering departments; by dragging a subheading to the heading at the top of the window, you can make any subheading the main heading of a more focused table.

To recall these customized displays (such as an outline or a table with a specific subheading selected), InfoDepot lets you define them as layouts you can select from the View menu. InfoDepot doesn't take the ability to open the layouts far enough, though, since you're limited to opening only one layout at a time. You cannot open a second window for the same file to see a second layout.

Although InfoDepot's new calendar window doesn't compete with those found in calendar programs like Now Software's In Control or Now Up-to-Date, it's a useful addition. You can display any column containing dates in the calendar window. Unfortunately, you cannot display all date columns in a calendar simultaneously. To simplify scheduling, InfoDepot lets you drag a date from the calendar window to a cell in the Table view; no longer do you have to worry about accidentally scheduling something on a Sunday or holiday.



Detailing a Project Time Line Two columns (Responsible Organization and Plan) have been added to this Timeline view. Both columns have AppleScripts attached to them, as indicated by the scroll icon in the upper-left corner of each column title. A Glossary window shows frequently used formulas that you can paste into any cell.

InfoDepot's Timeline view displays time-based data such as project schedules with less detail than do time lines in project-management programs like Microsoft Project. However, you can add columns containing additional information to the time line, such as the departments or the estimated costs.

The Form view allows you to display information from one row of a table at a time. The Form Design mode resembles Claris FileMaker Pro's Layout function: you drag column titles and contents from a holding area to a gridded layout area to create a form. Each title and contents box has a resize box for changing its size. You can add color, patterns, and borders to the boxes.

InfoDepot retains Fair Witness's free-form display for typing and drawing ideas but renames it the Chalkboard view. In this view, you can enter ideas and reposition them on screen, drawing lines to connect or group ideas, much as you would in a brainstorming session. InfoDepot doesn't provide a way for you to convert related items to an out-line (as Inspiration does), so you're left with the drawing you created.

Fair Witness supported different types of voting for reaching decisions and let you graph the results. Unfortunately, this feature is not available in InfoDepot. Instead, the support for formulas in the Table view lets you define your own equations for weighting votes and creating summaries. If you want to graph the results, you may have to write an AppleScript to send the data to another application, such as DeltaPoint's DeltaGraph or Microsoft Excel, and then copy the graph into a cell in your table. InfoDepot includes some prewritten AppleScripts to make this process easier.

InfoDepot was designed for use by workgroups, allowing you to define an InfoDepot file as a shared file. If more than one person is working on a shared file at the same time, the program automatically keeps a journal file of all changes and periodically updates each user's view of the file. InfoDepot supports password security for shared documents by letting you set one password for viewing and another for editing, and you can set a password on a column-by-column basis. If you're using PowerTalk, you can attach a digital signature to a column in a shared document, indicating that the column has not been changed since you signed it. This feature can be particularly useful in shared budget documents.

The Last Word

InfoDepot does a good job of serving as a central repository for most if not all of your project data. Its multiple views and the ease of switching between them make planning and coordinating projects a simple process. The ability to share documents also makes it easier for team members to contribute to a single plan. And to cap it all off, its powerful support of AppleScript lets you stay in InfoDepot and control other scriptable programs to supplement it.—DAVE KOSIUR

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(filus humongous)

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ClarisDraw 1.0

Draw Program

PROS: Good automated tools; clip art for producing maps, diagrams, schematics, floor plans, and blueprints. **CONS:** The fancier the drawing, the slower the program; poor text handling rules out text-heavy projects. **COMPANY:** Claris Corporation (408/727-8227). **LIST PRICE:** $399.

MW ★★★

CLARIS CORPORATION HAS TAKEN one of the original Gang of Three—the venerable MacDraw—and rehabilitated it for the world of Béziers, QuickTime, and living color. The overhaul is extensive, adding slide-making, outlining, painting, and text-handling tools; but the implementations are uneven.

Two Formats

In drawing terms, ClarisDraw lands somewhere between MacDraw and Bézier-based draw programs like Aldus FreeHand and Adobe Illustrator. ClarisDraw keeps MacDraw's old arcs, lines, boxes, ovals, and polygons, continuing to draw them in its own native format, and adds stars, regular polygons (hexagons, for example), and a host of set shapes as well.

ClarisDraw has new Bézier drawing tools (for freehand lines and polygons), but the two drawing formats aren't wedded well. To join a native-format shape to a Bézier shape means converting the former into Béziers first. Problem: Not all native-format shapes are convertible—straight lines and arcs, for instance, are not. In any case, ClarisDraw's "join" feature can't create a closed path—you can only add one open path to the end of an existing open path. For better drawing control, you can convert native-format objects—as well as characters from TrueType or PostScript Type 1 fonts—into Bézier-described shapes.

Nondrawing Tools

Many of ClarisDraw's nondrawing tools are innovative, clever, and amazingly easy to use, even if what they do graphically isn't dazzling. The program's alignment tools, for example, are an efficiency expert's dream. You can select a group of objects (including text blocks) and at the click of the mouse align them with each other at top, bottom, or sides, or along their vertical or horizontal axes. Likewise, one click can make objects the same height or width, or space them evenly apart from each other. You can also convert these alignments and alterations into permanent spatial relationships, so that if you move or resize one object ClarisDraw moves and resizes the others automatically. You can align objects on a catalog page—captions, call-outs, photos, drawings—with just a few clicks of the mouse, without any measuring, imprecise dragging, or aligning by eyeball. For flowcharts, floor plans, and engineering schematics, these tools are a godsend.

Other welcome nondrawing talents include the ability to zoom to any percentage and to save up to six zoom views for later use. Select some text, and an option-click at the new insertion point cuts it and pastes it. In the paint mode, the marquee can automatically trace and select a paint object of any shape. ClarisDraw automatically adjusts pasted objects from drawings made at different scales to fit the scale of the new drawing.

ClarisDraw's painting talents are modest, not unlike a color version of the old MacPaint, but painting is a handy capability, even if you can't do much with this implementation. You have to work in a paint frame, not simply a paint layer, and the memory requirements for paint frames are high. If you try to create an 8-bit (256-color) 300-dpi painting for imaging on a color laser printer, the program wants over 2MB of memory for a 4-by-6-inch image. You can't edit bitmapped images from outside the program (scans, for example).

ClarisDraw's color fills for objects, though, are fine. Its tools for creating gradient fills are the easiest I've tried (see "Color Blends"). You can also customize the program's solid-color palettes by adding any color available from Apple's Color Editor. Sorry, no Pantone colors.

Working with Text

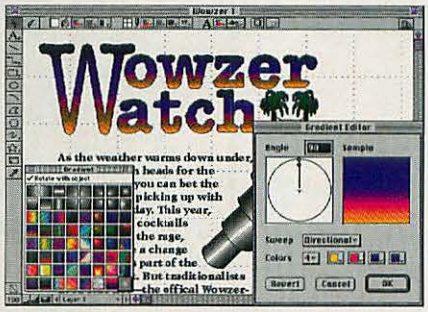
ClarisDraw also does a neat job of creating slide presentations. Its built-in outliner is great for slide presentations, and you can customize your presentations for 35mm slides, on-screen shows, or printed handouts.

Although ClarisDraw touts itself as a good tool for text—for making brochures and reports, for instance—it can't hyphenate, so justified text looks dreadful. And there's no single dialog box from which to set type specs—setting font, point size, and leading takes three trips to the Type menu.

You can control the overall spacing of text (tracking) only if it's bound along a path (something the program doesn't do well either). There's no manual kerning, so display type is often badly spaced. You can't set type on tight leading, because the background of the letters is opaque—if lines of type get too close together, the lower ones obscure the upper ones.

A cloud hanging over the entire program is speed. Give ClarisDraw a command and there's often a "Huh? Oh, yeah . . ." pause, like you caught it napping. It can be difficult to work quickly because you can issue a command before the program has executed the previous one. When you switch from draw to paint mode, the whole screen actually goes blank for a couple of seconds.

For this article I created a file containing a half dozen of ClarisDraw's own small clip-art outline objects that I filled with identical three-color gradients (taken straight from the menu) and aligned and linked with each other using the program's alignment-relationship tools.

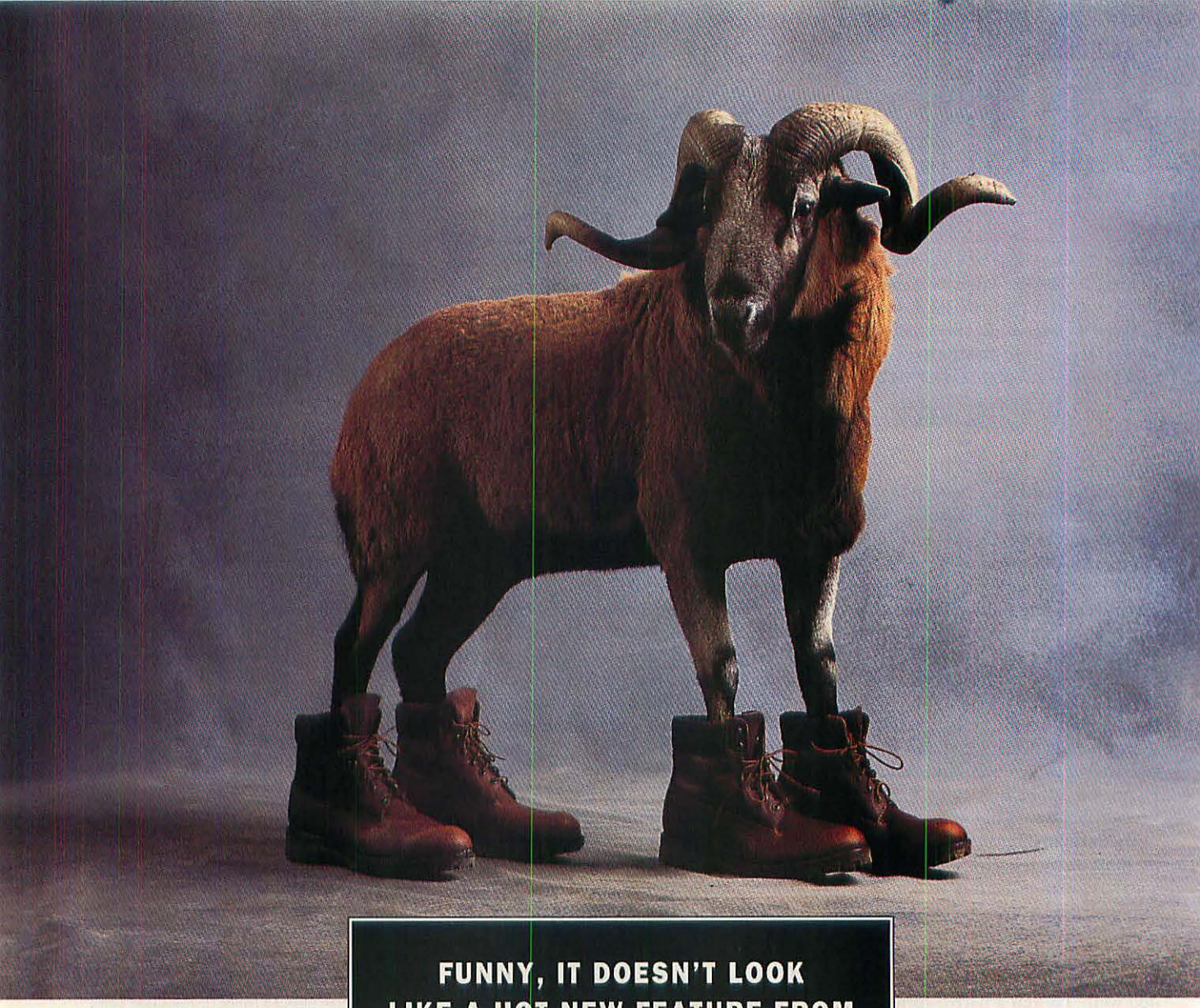


Color Blends The Gradient Editor lets you control the angle of the blend (the "second hand"), the width of the blended bands (the dot that slides along the second hand), and the colors (which you select from a pop-up palette). The tear-off Gradient palette offers an array of customizable variations.

Nothing fancy, but opening this half-page, 165K file took nearly five minutes on a 68030 Mac IIcx with 8MB of RAM, 4MB of which were dedicated to ClarisDraw (twice the recommended amount). Just to redraw the screen after closing a dialog box took almost three minutes.

The Last Word

With ClarisDraw's 10MB of clip art and its grid-oriented layout tools, the program is best suited for presentations, in the broadest sense of the term: engineers' schematics, maps, architect's drawings, blueprints, price lists, and slide shows. Graphic artists will find ClarisDraw frustrating—it just doesn't have the right stuff to compete in the professional ateliers. But for presentations without grand artistic pretensions, ClarisDraw can be an effective tool, although, considering the wobbliness of many of its features, $400 is a lot to pay.—JAMES FELICI



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Circle 206 on reader service card

Blueprint 5.0

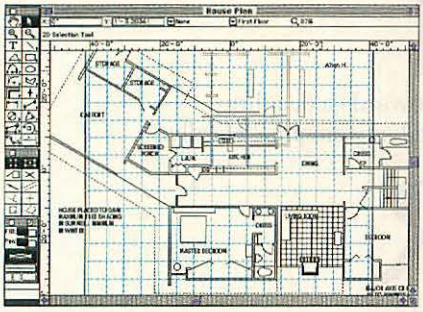
2-D CAD Software

PROS: Fast operation; nice feature-set for specialized drafting; reasonable price. **CONS:** None. **COMPANY:** Graphsoft (410/290-5114). **LIST PRICE:** $295.

MW ★★★★

GRAPHSOFT IS A MACINtosh success story. At each revision, its products add useful features yet run faster than their predecessors. Microsoft's Word 6 programming team could learn a thing or two from Graphsoft.

Graphsoft's Blueprint is an object-oriented drafting program that makes it easy to do the kind of drawing that used to occupy students for hours in traditional blueprint-oriented drafting classes. This is not state-of-the-art CAD: it has no 3-D features (which are available in Graphsoft's MiniCad), surface modeling, or animation, as the architectural programs that support 3-D walk-throughs do. It is, however, an excellent 2-D drafting program, and its list price is under $300.



Welcome Home What this still picture can't show is that Blueprint 5 on a Power Mac can rotate or zoom drawings as fast as you can issue the commands.

Blueprint's key new feature is improved speed. Version 5 comes with 680X0 and Power Mac programs in the same disk set. In 680X0 mode Blueprint 5 performs operations from 1.5 to 2 times as fast as Blueprint 4 does. On a Power Mac, it's even more impressive (see Macworld Lab's speed test results below). In practice, this means redraws of a nice 30-by-40-inch sheet covered with detail (a 250K file) are nearly instantaneous on a Power Mac. The trademark Graphsoft chatty cursor, which reports and changes shape as you move it across the objects in a drawing, now carries no speed penalty. This program feels significantly faster than equivalent 2-D CAD programs on a midrange Sparcstation. That's quite an accomplishment, both for Graphsoft and for Apple.

Blueprint 5 also has enough new features to justify a whole-digit version change. For precisely positioning objects on a page, a new Nudge command lets you move whole objects one pixel at a time. A new Offset tool lets you specify an object offset, and the Move Page tool shifts the page frame relative to the drawing. New drafting convenience features include a Tape Measure; a Protractor; and a 2-D Properties Display that shows area, perimeter, and centroid, among other functions. Blueprint's already nifty tools for handling objects in walls in architectural drawings have been augmented with Y-Join, Butt-Join, and Edit Symbols in Walls. A unique feature, TrueType to Polyline, converts text in a TrueType font to a set of Blueprint lines, making possible unusual font tricks such as distortions and stretches for dramatic titling and labeling.

Blueprint 5 ships with thoroughly educational sample drawings and a fairly complete symbol library, and exchanges files in PICT, EPS, and DXF formats.

The Last Word

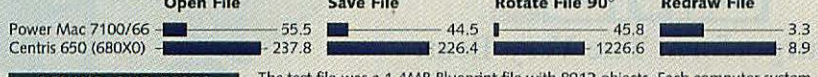
Blueprint has always been one of the most intuitive Mac programs for drafting, and that tradition continues. Although some pseudo–3-D features (simple extrusion, for example) would be nice, Blueprint users can step up to the 3-D world of MiniCAD 5 with minimal training. For plain old 2-D drafting, Blueprint has a rich, easy-to-use feature set and is admirably fast. The Power Mac version, in particular, is a first choice for large architectural or engineering diagrams.

—CHARLES SEITER

MW LAB

How Much Faster Is Blueprint on a Power Mac?

Times are in seconds. Shorter bars are better.



BEHIND OUR TESTS

The test file was a 1.4MB Blueprint file with 8912 objects. Each computer system had a 16-inch monitor set to 256 colors, 24MB of RAM, and an external 1.3GB Micropolis drive. Blueprint was allocated 16MB of memory.—**Macworld Lab testing supervised by Danny Lee**

MarcoPolo 3.0

Document Imaging and Management

PROS: Searches on title, contents, keywords, and comments; built-in OCR; user-access control; can use predefined keywords; can save queries for rerunning. **CONS:** Cannot create groups for access control. **COMPANY:** Mainstay (805/484-9400). **LIST PRICE:** $895; five-user client version $500.

MW ★★★★

LIKE A FINE WINE, MARCOPOLO KEEPS improving. Now shipping version 3.0, Mainstay has added OCR capabilities to its document-management program and offers a less expensive client version of MarcoPolo for users who don't need all the capabilities of the full-blown version.

MarcoPolo is organized around the concept of the document center, which stores searchable images of documents either on your Mac (an individual document center) or on a file server (a group document center). Aside from the network connection, you use both individual and group document centers the same way. The full-blown version of MarcoPolo includes administration options for document centers and an optical character recognition (OCR) capability. The client version is restricted to forming and running queries as well as saving or exporting the results of those queries.

The most significant new feature in MarcoPolo 3.0 is its OCR capability. Using OCR, you can now extract text from scanned documents and store the entire document—images as well as the associated text—for searching and retrieving. MarcoPolo does a nice job of dealing with unrecognized words, one of the problems with most OCR programs. When using OCR to process a document, MarcoPolo maintains the layout of the original document and inserts an image of each unrecognizable word into the OCR text. This way when you retrieve the document, you see the original layout and might be able to recognize the words that didn't make it through OCR.

In an effort to make OCR as simple and reliable as possible, MarcoPolo uses dictionary-based word recognition for the language of your choice, as well as letter-pair recognition, which you can customize (to help distinguish between *th* and *tn*, for example). And since not all documents are the same quality, you can create and store scanning tem-

continues

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Circle 288 on reader service card

plates for different types of documents; these templates store scanner settings such as brightness and resolution.

In an effort to make archiving multiple documents easier while retaining the power of OCR, Mainstay lets you import TIFF files into MarcoPolo for automatic OCR scanning. If you don't want to use MarcoPolo's OCR interface, you can use an alternate scanning program to scan and store your pages as TIFF files. You can then place the TIFF files in the drop folder associated with the MarcoPolo document center and use MarcoPolo's OCR option to convert the files to text.

Users of the full-blown version of MarcoPolo can now add text notes to any page that's stored in a document center.

Can You Read It? The frontmost window contains a page with OCR-recognized text along with unrecognized words, which are in boldface. (This document was scanned without any refining of the default scanning parameters.) The background window shows the results of a MarcoPolo query. In the lower-left corner is a thumbnail view of one of the documents found in this query.

These notes can be placed anywhere on the page and are available whenever you access the document.

MarcoPolo's new archive-by-proxy feature lets the owner or originator of a document assign a proxy password to someone else to archive documents for the owner. Proxy passwords apply only to archiving documents and cannot be used to create or run queries.

Other significant new changes in MarcoPolo include support for more predefined keywords (up to 64 for each of the 7 keyword headings), autonumbering of archived documents to preserve the archive sequence, and an option to change the archive date (to match the date of creation of a document rather than its archiving date, for example).

The Last Word

MarcoPolo is a significantly improved full-featured document-management system for Macs. The addition of OCR—both the handling of unrecognized words and the ability to batch-process TIFF files with OCR—makes MarcoPolo 3.0 a very usable system.—DAVE KOSIUR

Wiz Tools for PowerBook 1.2.2

PowerBook Utilities

PROS: Good connectivity and file-synchronization modules. **CONS:** Security module is not compatible with System 7.5; other modules are so-so. **COMPANY:** ASD Software (909/624-2594). **LIST PRICE:** $79.95.

MW ★★★

WIZ TOOLS FROM ASD SOFTware is a mixed bag. This collection of PowerBook utilities has some modules that are so-so and some that are useful. Fortunately, you can activate the tools you want and leave the others off. Let's look at the good stuff first.

Synchro is a file-synchronization tool that allows you to synchronize data between your PowerBook and your desktop Mac. Synchronization can be done manually, at shutdown (as long as both Macs are networked), or at preset times. Your file-synchronization routine can include an entire disk volume or individual folders and files, and you can exclude individual items. Synchro has some useful safety features, too. For example, if two files have been modified at different times, Synchro asks you to decide what action to take—so you don't lose the wrong file.

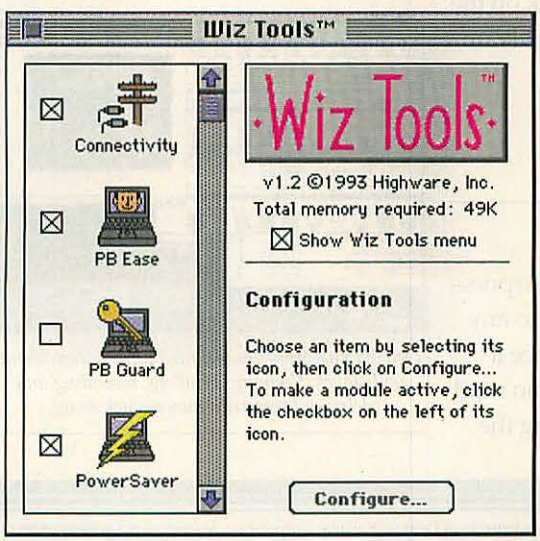
The Connectivity module lets you automate Apple Remote Access connections. You create profiles, and Connectivity uses them to log on to different access sites. You can set up keyboard shortcuts to perform actions when you connect to remote sites, such as activating file synchronization. Other options allow you to have AppleTalk automatically switched off if your computer starts up or wakes up without a network connection. If you restart or wake up after hooking up to a network, AppleTalk turns on automatically. You can also toggle AppleTalk on and off as needed.

The PB Guard module provides full security protection for your PowerBook, and unlike some of the other available products, it works on the driver level. You cannot get around password protection if you start with extensions off or with a floppy start-up disk.

The rest of Wiz Tools is rather undistinguished. The PowerSaver module lets you control the intervals for such functions as hard drive spin-down, processor rest, backlight dimming, and sleep. It doesn't take you much further than the standard PowerBook control panel shipped with Apple's latest system software. WorldClock is a module that puts up a menu-bar clock and chimes on the hour. You can set aside separate clock-setting profiles for different time zones. System 7.5's Date & Time control panel has capabilities that add many of these functions to your Mac's system software.

PB Ease has possibilities but just misses the mark. It lets you thicken and animate cursors for improved display on passive matrix PowerBook screens. You can establish drop menus and add keyboard shortcuts for dialog boxes. But unlike, for example, Connectix's CPU, Wiz Tools doesn't offer Windows-like keyboard shortcuts for menu-bar commands. You can also assign keyboard shortcuts to represent the page up, page down, home, end, and ten function keys. On Apple's newest PowerBooks, the 500 series, the function keys are part of the keyboard. Still, if you own an older PowerBook, this feature can be useful.

The manual is brief but informative. Technical support is a toll call; if support personnel are busy with other calls, they'll get back to you promptly.



Have It Your Way The Wiz Tools control panel lets you activate the individual modules and configure preferences.

The Last Word

If the connectivity file-synchronizing and security features of Wiz Tools appeal to you, the package is worth considering. The rest of the modules are also-rans among PowerBook utility packages.—GENE STEINBERG

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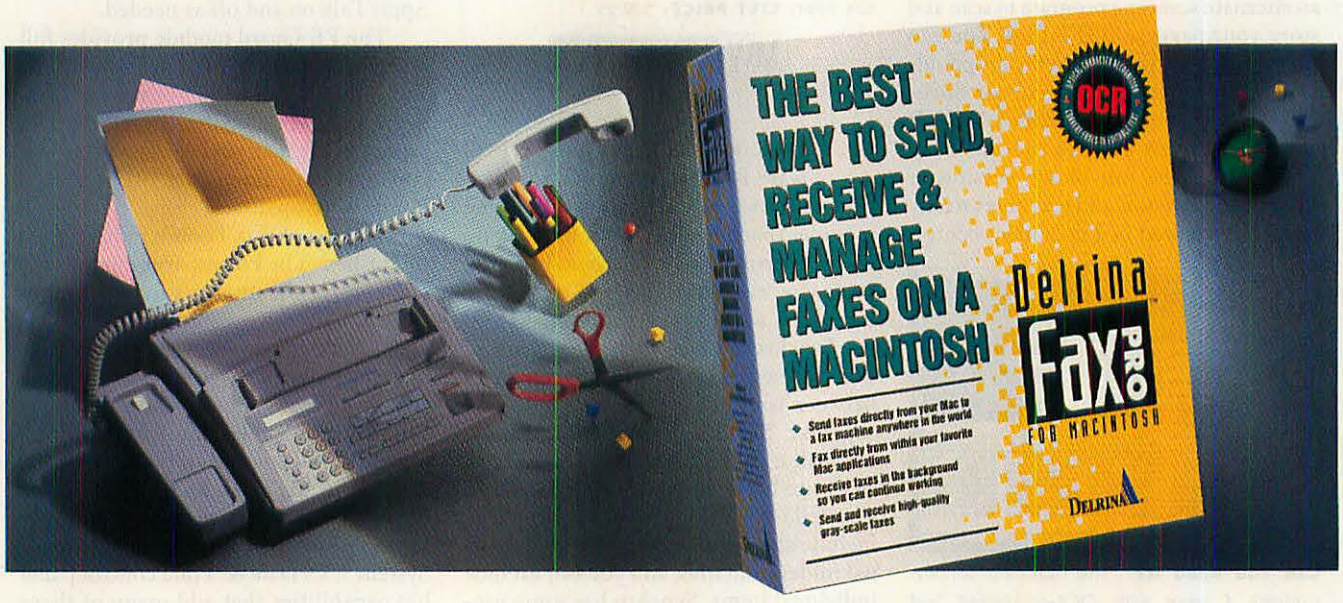

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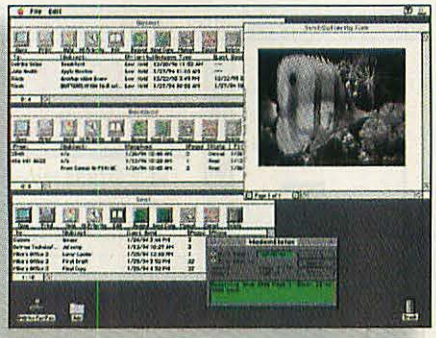

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Peirce Print Tools 1.0

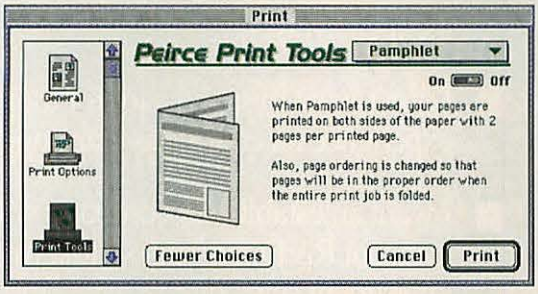
QuickDraw GX Print Utilities

PROS: Fast, efficient performance; good choice of enhancement tools. **CONS:** Requires QuickDraw GX; few Mac programs support GX features. **COMPANY:** Peirce Software (408/244-6554). **LIST PRICE:** $129.

MW ★★★

APPLE'S NEW QUICKDRAW GX totally revamps the Mac's printing architecture, provides tools to create fonts with thousands of characters, and offers system-level tools for complex graphic effects such as rotating and reshaping text and pictures. Peirce Print Tools is a set of nine handy modules that work with QuickDraw GX. (The software also includes QuickDraw GX, which requires System 7.1 or later.)

If the program you're using is GX-savvy, the Peirce Print Tools modules are all available from the Print dialog box. For programs that have yet to join the GX bandwagon (which includes most Mac software), you choose modules via a menu-bar icon that appears when you bring up the Print dialog box.



Printing It Your Way In GX-savvy software, a single dialog box with pull-down menus lets you choose which Peirce Print Tools modules you want to use.

Most of the modules are useful, but not all are must-haves. Perhaps the best of the bunch is InkSaver, the toner-conservation module. It lets you reduce the darkness of your proofing documents, then restore the full toner-density setting for the final version. Whether or not you are concerned with ecology, this will surely make your expensive toner cartridge go farther. Border places a preselected frame around your printed page, and WaterMark creates a backdrop on your printed page, from supplied templates. Both of these utilities save you the drudgery of creating these fancy effects.

The other modules are good performers, but you probably won't use them as frequently. BackToFront is a utility that prints pages from last to first. CoverPage creates a custom first page, based on preselected templates. DoubleSider makes printing on both sides of the page easier, simply by printing your document from front to back on the first pass, and back to front on the second. Log tracks printer usage. Pamphlet is used to create bifold booklets. PaperSaver lets you print thumbnails of your document, sized proportionately from 2 up to 16 per page. Finally, a separate program, Peirce Print Utility, lets you import custom cover pages and watermarks, or view the contents of the printer-usage log.

You can select options separately or use them together. You can also create custom groups, in which individual Peirce Print Tools features are activated or disabled, and attach them to a specific desktop printer icon. Since QuickDraw GX lets you create more than one desktop printer icon for the same printer, you can use a separate icon for each group of Print Tools options.

The tools themselves all work as advertised. Their programming is slick, and they perform admirably. The watermarks I used printed crisp and clean from my laser printer. While there are other products (such as Portfolio Software's DynoPage, Bookmaker Corporation's ClickBook, and Working Software's Working WaterMarker and Toner Tuner) that offer some of the same features, having such tools all conveniently bundled in a single, well-integrated utility is a real plus.

QuickDraw GX has its own attractions (see "System 7.5" and *Graphics* news, *Macworld*, September 1994). But it's also a resource hog. On a Power Macintosh, the GX extension alone requires up to 2MB of RAM. It makes one wish that Peirce Print Tools didn't require installation of GX.

The Last Word

Apple supplies two of the Peirce Print Tools modules, PrintSaver and WaterMark, with the CD-ROM version of System 7.5. If you decide to get Apple's new system software, you'll get a chance to sample this package too. While some of the best parts of QuickDraw GX won't come till software developers support the tools, Peirce Print Tools is here now, and it's definitely a product you should consider.—GENE STEINBERG

TypeTwister 1.0

Type Styler

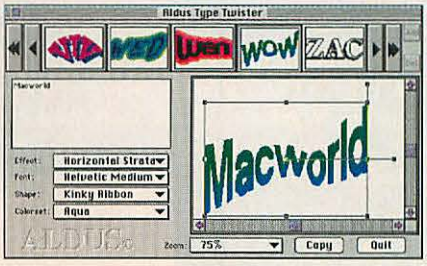
PROS: Many good prebuilt font styles; fast; inexpensive. **CONS:** Can't resize main window; limited customization. **COMPANY:** Adobe Systems (415/961-4400). **COMPANY'S ESTIMATED PRICE:** $29.95.

MW ★★★★

SOMETIMES, GETTING YOUR POINT across in print requires using a little pizzazz. When plain fonts just won't do, TypeTwister lets you create wildly styled text effects. These type effects can be used in printed fliers, presentations, newsletters, or anywhere you need fancy type.

It's easy to get started with TypeTwister, as virtually the whole program can be used from one window. That main window includes a text-preview area with six magnification options; a field for the text you want to style; a scrolling bar of design buttons with 50 prebuilt text effects; and pop-up menus for Effect, Font, Shape, and Colorset text attributes. There are also buttons that let you copy the text to the Clipboard, and there's a quit button. TypeTwister comes with 20 display fonts, and works with any TrueType or PostScript Type 1 font (you must have Adobe Type Manager installed to preview PostScript fonts correctly).

To create a type effect, scroll the bar of design buttons and select the style you like, then type the text you want to style into the text-entry field. The program immediately renders your styled text. The previewed text appears in a frame with handles that you can use to stretch, resize, rotate, and skew the text. To further modify the text effect, TypeTwister comes with dozens of predefined attributes you can choose from pop-up menus (you can also create and customize your own color sets and text effects).



Type Tweaking You can resize, stretch, rotate, or skew the prebuilt type designs (in the bar of design buttons at the top of the screen) by clicking and dragging the handles on the design's frame.

continues

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MiniCad 5 also includes: speed increases up to 100% even on 68K-based Macintoshes, a Claris CAD conversion program including a $495 upgrade price, a Claris CAD translator, and a helpful conversion guide, translators for importing and exporting to the other major CAD products, an upcoming Windows version, multi-media training CD 18 months of free technical support and a no-hassles 30-day money-back guarantee through authorized dealers. Contact Graphsoft today for detailed literature. To order immediately, call MacWarehouse, MacConnection, or your local dealer. Demo: $19.00

Late Breaking News

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SEE US AT COMDEX BOOTH 313

Rendering time for text effects is impressive. On a 68040-based Centris 650, with a moderately complex text effect, the phrase "This is a test" rendered in the preview window in 2 seconds. On considerably slower machines, such as my 68030-based PowerBook 140, the same phrase and effect took 13 seconds to render, which was still bearable. Naturally, the more text to be rendered, the longer it takes, but usually you will apply effects to only a few words at a time. Rendering text is fast enough to try many style combinations and see the results quickly.

You can't print or save your designs from within TypeTwister; you must transfer the design to another application by copying and pasting through the Clipboard. When the program saves the design to the Clipboard, it saves a 72-dpi preview image along with a 300-dpi embedded PostScript image. The latter resolution is fine for most office laser printers, and you can increase the output resolution using the program's Preferences dialog. Higher resolutions require more memory than TypeTwister's standard 1MB and take longer to save to the Clipboard.

Probably the most annoying part of TypeTwister is that you can't resize the main window. You're forced to use a relatively small preview window. While this undoubtedly improves the program's rendering and redraw speed, it would be better to have the option of more speed or more screen real estate.

TypeTwister isn't going to satisfy hard-core type manipulators. You can make only limited changes to type designs, and the changes affect the entire design; you can't modify individual letters in the design. And unlike programs such as Adobe Type Align, TypeTwister doesn't let you tweak the overall type shape by dragging one of the corner handles independently of the others.

The program's manual claims that TypeTwister is OLE- (Object Linking and Embedding) and Apple event–aware, but I found neither of these claims to be true. I was unable to insert a TypeTwister picture as an editable object into Microsoft Word 6.0 (which is OLE-compliant), and TypeTwister is not an Apple-scriptable application.

The Last Word

TypeTwister is inexpensive, easy to use, and fun—always good attributes for software. The program provides an impressive array of text styles, and you can easily modify the prebuilt styles to meet your everyday needs. It's a great way to add some extra sizzle to a presentation, flier, or slide show.—TOM NEGRINO

BLAST Professional

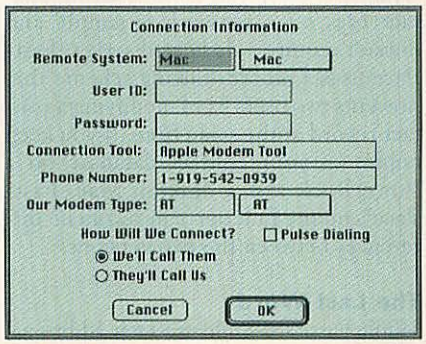
Telecom Software

PROS: Decent single-file transfer speeds (when you can get it to work). **CONS:** Difficult to achieve efficient connections; file-transfer problems; poor interface; random freezes; lacks automated script-creation capability.

COMPANY: BLAST Inc. (919/542-3007). **LIST PRICE:** $139.

MW ★

BLAST IS BOTH THE NAME OF THIS telecommunications software and an acronym for its proprietary file-transfer protocol. It stands for Blocked Asynchronous Serial Transmission, a transfer scheme that allows full duplex file transfers, where you can send and receive a file at the same time. (The computer on the other end of your communication must also be using BLAST.) This would make large file transfers much more efficient in terms of time—if it worked. Unfortunately, the problems I encountered while using this special transfer technique were just some of the many I experienced with this software.



Doing It the Hard Way To use Apple's Modem Tool with BLAST Professional, you must type the name of the tool in the settings window; otherwise BLAST won't recognize the tool.

BLAST Professional offers a dozen terminal emulations, ranging from the standard TTY to less common setups such as Data General D200, D410, D411, and 461. BLAST promises compatibility with personal computers and mainframes from a host of manufacturers. In addition to the BLAST protocol, the program offers the usual range of standard file-transfer protocols, such as Xmodem, Ymodem, Zmodem, and Kermit.

The program's scripting capability allows you to automate your dialing and log-on sequences and perform other tasks automatically as well. Its biggest weakness is that it cannot generate scripts based on the steps you take (unlike programs such as Software Ventures' MicroPhone Pro and FreeSoft's White Knight). That means you must learn its scripting language and manually type all the steps in your scripting routine.

BLAST Professional's interface is startlingly minimalist. There's no Save or Save As command in the File menu for saving settings files. Unlike in other telecommunications programs, there's no address book in which to store frequently used connection settings. You can create custom setups, but nothing shows you which setup you've opened (you must look through a configuration dialog box to figure it out). While other programs provide tools such as the Apple Modem Tool in a pull-down menu, BLAST makes you manually enter the name of the tool in the Connection settings dialog box. If the name is too long, BLAST simply removes the additional characters and ignores the tool's existence.

Testing the BLAST protocol was frustrating. I set up two almost identically equipped Power Macintosh 8100s with Supra 288 modems (one in Arizona, the other in Oregon). I've successfully used this same setup to transfer large files with MicroPhone Pro, White Knight, and Aladdin Systems' SITcomm. When I tried BLAST Pro, it was difficult to connect to and stay connected with the modem at the other end. On a few occasions, when I did get a good connection, I would suddenly lose the connection or the program would freeze. Over several days (at different hours of the day) I tried to get a successful, sustained hookup. BLAST Inc.'s technical-support people suggested a few changes in modem settings, but these didn't result in much improvement. When I achieved connections for brief periods, duplex transfers using the BLAST protocol proceeded at a snail's pace (1 percent of a 1.4MB file over 10 minutes with a 24,000-bps connection). When the connection was lost, I was unable to resume a partial download (even though the manual says this feature is supported). I could log on to several bulletin board systems, however, and transfer files using Zmodem. Under these circumstances, problems were less severe, though still present.

The Last Word

I could not get BLAST Professional to work reliably and consistently during my tests. I also didn't like its minimalist and quirky interface. This is not a program I can recommend.—GENE STEINBERG

FastPace Instant Contact 1.0

Contact Manager

PROS: Fast; straightforward interface. **CONS:** Application must be running to search database; no integrated scheduling program. **COMPANY:** Foresight Technology (817/731-4444). **LIST PRICE:** $79.99.

MW ★★★

IF YOU NEED SOFTWARE TO HANDLE a growing roster of contacts, your choices range from simple address books like ComposeTel's Souvenir to general-purpose PIMs like Common Knowledge's Arrange (see *Reviews*, December 1994). FastPace Instant Contact takes a middle-of-the road approach by providing comprehensive contact management but no scheduling functions.

FastPace is intuitive and easy to use without referring to the manual. (Just as well, since I found coverage skimpy in places. For instance, some field types aren't adequately explained, and the index is spotty.) A handy feature that displays prompts at the top of the screen when you point to a tool or object also helps new users come up to speed quickly.

FastPace has the features that you'd expect from a field-based contact manager, with 16 name and address fields (including separate fields for home and work addresses), 10 phone fields, 11 custom text fields, 2 number fields, and 3 date fields. A separate notes field holds up to 32K of text, and a check-box field lets you mark contacts for quick access. You can also define tags like "friend" or "business associate" to categorize contacts; oddly, the current release lets you repeatedly assign the same tag to a contact. Several built-in shortcuts help cut down on keystrokes when you're adding new contacts. For example, you can define pop-up menus that contain commonly used entries like salutations or city names. (But FastPace lacks an autocompletion feature for filling in a field as soon as you've typed enough characters to match an item from a predefined list.)

FastPace's lookup options range from simple scans based on a single field to complex multifield searches. (You can also look for contacts by tag, but not in the same operation as a field lookup.) Matching records appear in a separate list view that offers fewer functions than some other programs. For example, you can specify the name and order of fields in the display, but you can't change the font or color, and you can't edit contact data directly within the list view. FastPace also lacks a control panel that would let you look for contacts without launching FastPace, a feature found in competing programs like Portfolio Software's Dynodex.

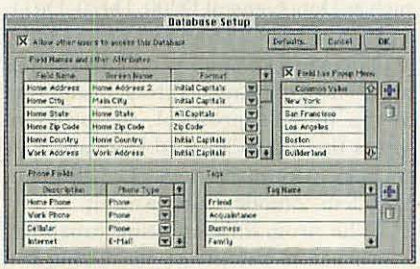
You can print contact information in a variety of formats, including address books, fax cover sheets, envelopes, and labels. An integrated word processor lets you create custom documents that contain embedded contact information. Although billed as full-featured, the word processor lacks some basic functions, such as find and change. Also, there is no way to import files created with other word processing programs, and you can't save documents for use elsewhere.

FastPace handled my test database of 8000 contacts without a hitch, even on my aging Mac IIfx. FastPace lets you open several contact files at once, and you can drag contacts from one database's list view to another if you install FastPace's Drag-and-Drop extension. Sharing contact files on a network is simple and doesn't require a dedicated server. FastPace uses a record-locking scheme that prevents two users from modifying a contact record at the same time. If you keep copies of your contact database on a PowerBook and a desktop Mac, FastPace's merge function can reconcile differences between the two versions.

The Last Word

While FastPace could use a few additional features—especially a menu-bar search function—it does a capable job of contact management. FastPace does not offer two-way sharing of contact and scheduling information the way Now Contact and Now Up-to-Date or Aldus Consumer Division's TouchBase & DateBook Pro do. (An update that allows FastPace to send contact data to Attain's In Control may be shipping by the time you read this.) If your needs are primarily confined to contact management, FastPace Instant Contact is worth a look.

—FRANKLIN N. TESSLER



Fields Galore FastPace's Database Setup window lets you enter a custom screen name for every field in your contact database.

Launch Pad 1.0

Desktop for Kids

PROS: Protects files from kids; customizes Mac according to child's age. **CONS:** Alters System file. **COMPANY:** Berkeley Systems (510/540-5535). **LIST PRICE:** $49.99.

MW ★★★★

LAUNCH PAD, FROM THE MAKER OF the popular After Dark screen saver, is a new utility that takes the worry out of sharing your Mac with kids. Instead of the desktop, your child sees an animated puppy in a rocket-propelled car. Clicking on his or her name at the bottom of the screen opens an account that lets the child access only the desk accessories, applications, and documents that you preselect.

Kid's-Eye View Launch Pad lets kids use only the applications and documents that appear at the bottom of the screen.

Launch Pad also adjusts controls like mouse sensitivity and key repeat rate to suit your child's dexterity. You can even tell Launch Pad to speak menu items and file names out loud, a boon for kids too young to read. For maximum protection, you can set Launch Pad to load automatically at start-up. Once it's running, you have to enter a password to exit Launch Pad—even hitting ⌘-option-escape doesn't force the program to quit.

The only drawback to Launch Pad's security is that the installer makes changes to your System file, which could lead to incompatibilities on some Macs. With Launch Pad installed, extension managers such as Casady & Greene's Conflict Catcher no longer respond to the keyboard at start-up, although you can still turn them on and off from the Finder.

The Last Word

A few minor inconveniences are a small price to pay for peace of mind, though. If you want to share your Mac with your kids, Launch Pad is a worthwhile investment.—FRANKLIN N. TESSLER

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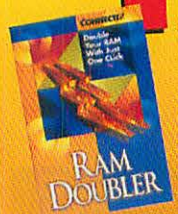

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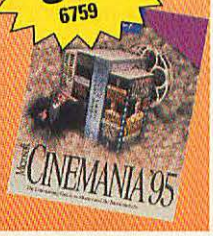

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Vivace

Music Study System

PROS: Synthesized accompaniments follow live soloist's tempo. **CONS:** Limited repertoire available at release; high initial cost; repertoire sold separately. **COMPANY:** Coda Music Technology (612/937-9611). **LIST PRICE:** $2295.

MW ★★★★

MUSICIANS PREPARING ORCHESTRAL solos and contest pieces have to cajole and oftentimes pay rehearsal pianists to work with them. As an intelligent—and endlessly patient—accompanist, Vivace may pose a serious threat to the pay-for-play type. This technology leaves the old music-minus-one concept in the dust.

Vivace consists of a sound module (an enhanced E-Mu Proteus, a fully functional MIDI instrument), a start-stop foot switch, a clip-on microphone that attaches to your instrument, cabling to your Mac, and a few small files for your hard drive. (You supply the required speakers or headphones.) A practice repertoire comes on a game-style cartridge ($15.95 to $250 per cartridge, depending on the number of pieces) that slips into the sound module. While the notes and sounds reside in the sound module, the Mac controls the flow of notes.

Vivace does not play accompaniments in strict time and force you to keep up. Instead, once you load the musical selection into the system, the clip-on microphone picks up the tempo from the live performance and alters the playback accordingly. You define Vivace's sensitivity to tempo, and you can vary it by section. This one feature makes performing with Vivace a joy. You can also identify troublesome passages, slow them way down, and set them to loop over and over until playing them becomes second nature. I used the looping feature to learn some scary arpeggios in the Mozart Clarinet Concerto's first movement.

A trumpeter friend was astonished by the accompaniments to the Haydn Concerto in E-flat and the Hindemith Sonata. Vivace's piano accompaniment to the Hindemith, a notoriously dry composition, has a lively presence that caused her to revise her opinion about the whole piece. The Haydn bubbles with baroque energy, and you can actually hear the digital "bows" scraping across "strings." Educators to whom I showed Vivace were unanimous in their praise. Much of Coda's repertoire is based on standard contest and audition pieces—music advanced students may already be working on.

Another plus: Coda is preparing the entire Jamie Aebersold library of 54 jazz play-along records for Vivace. Tempos in these pieces don't follow the live performer's melodies as the classical pieces do; you can alter the tempos and transpose their keys on the Mac. The rhythm section on the Aebersold volume I tested was excellent—harmonically inspiring, loose, and swinging.

ROBERT PERRY

The Last Word Vivace defines a new, exciting product category. It may be the best thing that's happened to learning wind literature since the metronome. All you vocalists and other instrumentalists will just have to wait until Coda fills in the product line. It'll be worth it.—RICHARD FENNO

Bird Brain 2.01

Database for Bird-Watchers

PROS: Includes species names and other information; partially automated data entry; wide variety of predesigned reports. **CONS:** Can't divide records into different databases; can be slow. **COMPANY:** Ideaform (515/472-7256). **LIST PRICE:** $125.

MW ★★★

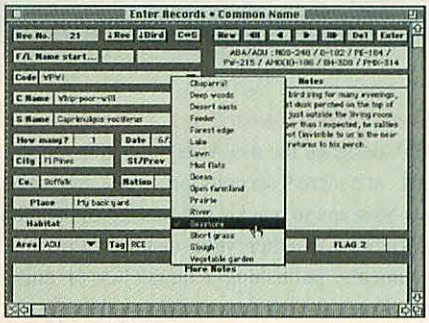
BIRD BRAIN 2.01 LETS BIRD-WATCHERS record every sighting of every bird they have ever seen, to create electronic life lists. Bird Brain already knows common and scientific names and major field-guide references for the 1946 species of birds in North and Central America, Hawaii, the Bahamas, and Bermuda. After you enter just a few letters of a species name, Bird Brain guesses which species you want and then enters the species information for you.

Bird Brain also copies the previous record's Date, City, County, State or Province, Nation, and other location fields to each new record; you can, of course, change these entries if need be. Each record also contains two notes fields—one for brief comments, the other capable of holding a full page of text. The Tag field's pop-up menu allows you to assign a user-definable, multiletter code to each record, and you can specify *Yes* or *No* (or nothing) in two user-definable Flag fields (for example to note the presence or absence of a nest).

Bird Brain has standard record-finding and sorting functions and can display a tally of the number of species on each of your life lists. The program can print individual records, and it can display and print life lists for any state, for North America, for areas defined by the AOU (American Ornithologists' Union) and ABA (American Birding Association), even for the world, either for all records or for a specified year. It can also generate seasonal lists, trip lists, simple lists of species, and other types of lists.

If you travel outside the areas covered by Bird Brain, you'll want World Bird Brain ($175, including the basic Bird Brain software), which contains data on all 9679 known species of birds on Earth.

If you travel beyond Bird Brain's area of coverage only infrequently, you can manually update and add species to Bird Brain's existing species list. To ensure that the data for each species is correct and compatible with World Bird Brain (should you decide to upgrade to it later), you can use Bird Picker ($30), a separate—somewhat cumbersome—utility that installs, bird by bird, the species data found in World Bird Brain.



Crazy about Birds To help you standardize location details in Bird Brain, the Place and Habitat fields offer user-definable lists in pop-up menus. Field-guide page references are above the Notes section.

The Last Word Inconveniently, many types of data—from weather and time of day to sex, age, and behavior—can be recorded only in the free-form notes sections. Even more inconvenient is the fact that Bird Brain occupies 1.2MB of disk space before you enter a single record (World Bird Brain uses more than 4MB); and all records are stored within the program rather than in database files. And because Bird Brain is a disk-based Double Helix database (the Double Helix engine is provided), its sometimes slow performance becomes slower as your sightings increase. These points aside, however, birders will find much to crow about in Bird Brain.—ROBERT C. ECKHARDT

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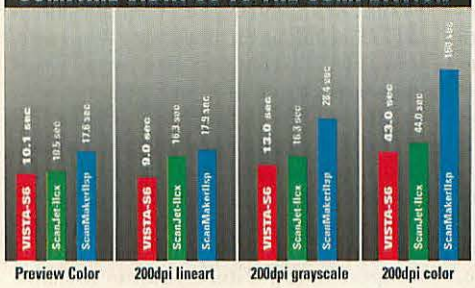

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Practica Musica 3.0

Music-Teaching Software

PROS: Colorful, enhanced design; excellent accompanying textbook; offers entertaining training for every skill level. **CONS:** Minor bugs; occasional interface irritations. **COMPANY:** Ars Nova Software (206/889-0927). **LIST PRICE:** $140.

MW ★★★★

THE NAME PRACTICA MUSICA, Latin for "practical exercises in music," probably conjures up visions of droning away with dull drills. Yes, Practica Musica (PM) is a music-teaching program, with emphasis on sight-reading and ear training, and it's based on traditional classical-music courses. But it offers instant feedback and a constant association between how notes look and how they sound.

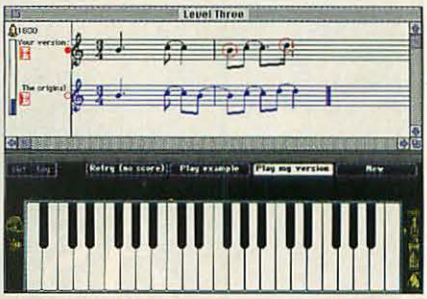
Version 3.0 is more colorful, offers more variety, and features more explanatory, beautifully written on-screen text than the previous version. The new multiuser feature permits each student to carry around a personal floppy disk with progress records; this feature is slightly intrusive to the individual home user, but it's probably a godsend to music educators. And PM's new exercises do a terrific job of teaching chord sequences. (PM's now hip enough to teach extended jazz chord types, too.)

From a 17-item menu, you select an exercise: sight-reading, intervals and chords, scales, rhythms, or combinations thereof. Most exercises ask you to name, play, or write a certain interval/chord/note/rhythm on the on-screen blank staff. You enter your musical response using any of four methods. You can play the Mac's keyboard like a piano; use the mouse to click notes onto the staff; attach a MIDI synthesizer and play the keys; or sing the notes, using Autoscore, an add-on from Wildcat Canyon Software.

You're graded with tact and clarity. The mercury in a thermometer rises as you master tougher tests; the payoff is a thunderous recorded ovation.

The program also comes with a textbook. It's a music class in itself, covering topics from basic scales to voice leading and harmony. The book's examples are included on the disk, so you can play and edit them, and conversely, the book frequently refers you to exercises in the software.

PM has its quirks. For example, the manual warns of conflicts with Berkeley Systems' After Dark, accelerator cards, and so on. When you're using the Mac's speaker (instead of a synthesizer), chords play much softer than single notes. And after you choose an exercise, nothing happens; the program should tell you that you must select a skill level from a menu.



Practically Musical After an exercise, the program points out your errors. If any.

The Last Word All kinds of people could benefit from PM's brand of gentle musical self-improvement. A tyke would enjoy playing random melodies on the Mac keyboard. Anyone learning an instrument (or singing) should try the pitch and rhythm exercises. Jazzers and rockers may scoff at the program's quaint founding in classical theory—but they'd do well to pit themselves against the chord-sequence challenge. And of course, Practica Musica shines as a smart, infinitely patient personal music coach in the classroom.—DAVID POGUE

Aquazone 1.0

Aquarium-Simulation Software

PROS: Beautiful, well-done animations; adjustable simulation speed; the well-written manual keeps the inexperienced from floundering. **CONS:** Only two kinds of fish; hard to keep fish alive; no bubbling bell-divers or treasure chests. **COMPANY:** Inago (416/487-4005). **LIST PRICE:** $79.95.

MW ★★★

I CAME BACK FROM VACATION TO A note that read "So sorry about your fishies . . . I think they missed you an awful lot." Disease had wiped out the pets in my little live aquarium. A couple of days later, a coworker placed a copy of Aquazone by my Mac. Some hard-core aquarists have schooled together and designed the ultimate virtual aquarium. This is digital life—these electronic pets require daily attention.

Everything you need is provided, so setup is easy. You choose a tank based on screen size, not gallons—the stock filter, heater, and light are in place. There are also five kinds of gravel; a handful of decorative elements like plants, wood, and mini statuary; and ten tank-backdrop designs.

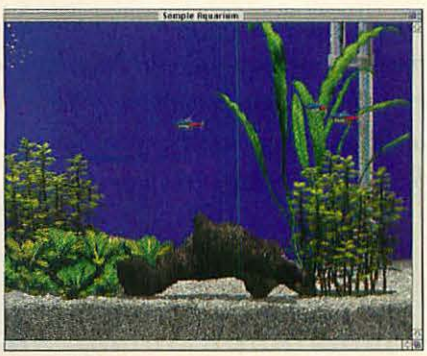
Aquazone comes with two species of fish: leopard catfish and neon tetra. That strikes me as darn few fish, but the programmers don't see it that way. They've handcrafted animations for roughly 20 individual fish per species, for a total of 40 fish, from eggs to aquarium old-timers of several years in age. Still, I can't tell the fish apart except for obvious size differences. There appear to be four sizes of each species—egg, tiny, medium, and big—and frankly, if I get 40 fish, I'd rather have 10 species in four sizes than 2 species in four sizes.

The company says it's committed to bringing out more fish species. A series of option disks ($19.95 each) have more accessories, more plants, and one new species of fish per disk.

The minimum RAM requirement is 2.5MB, but that doesn't buy much simulation stimulation: the program crashed when I tried to import food into a 13-inch tank with two fish and some sand. That spartan arrangement worked in a 10-inch tank—with room to spare for a small plant. Bump it up to 5MB to build a pleasant, well-stocked aquarium.

A few days after setting up my tank, I had a diseased fish. The situation turned ugly fast: a week later all my virtual pets were dead, their little rotting corpses littering the floor of the aquarium until I exported them to the Toilet. I suspected that they didn't like going the weekend without food. The simulation speed adjusts from 0 to 100, but even with the lowest-speed simulation on the weekends, my fish still died. So did those of another Aquazone aquarium–loving coworker. I've read the manual—which could almost be a guide to maintaining an actual aquarium—looking for clues as to why these fish are so darned hard to keep alive, with no luck.

The Last Word Even so, I like having Aquazone in the background. It's very soothing. Would I buy it over the real thing? No, but then again, how many offices permit several gallons of water sitting next to computer equipment?
—SUZANNE COURTEAU



Fish Included Aquazone comes with a ready-to-go aquarium for the instant-gratification crowd.

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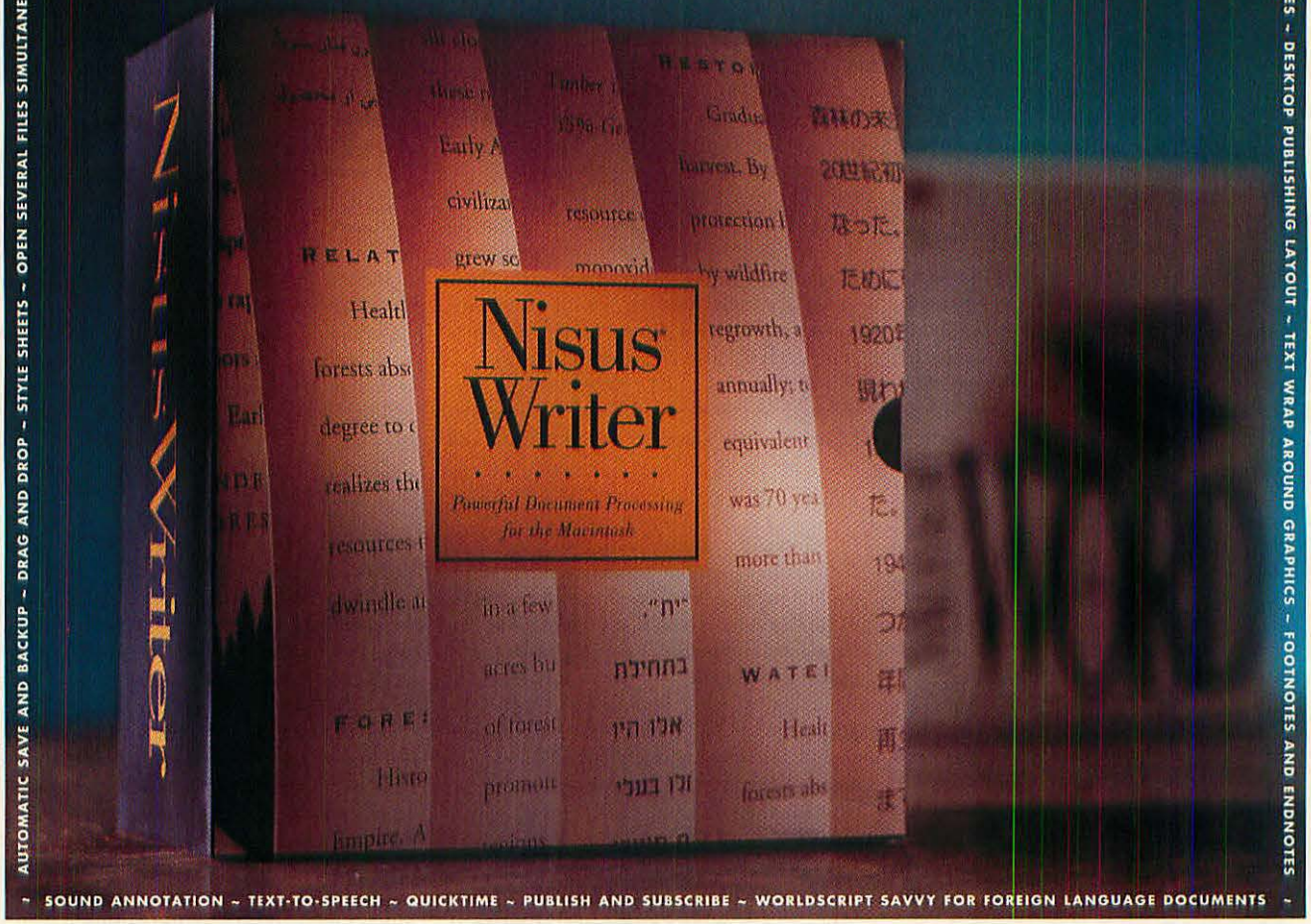

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Amazing Animation

Animation for Children

PROS: Creative application; great price; comes close to making a complex task fun. **CONS:** Younger children may find the advanced features challenging; canned animations and scenes grow tiresome. **COMPANY:** Claris (408/727-8227). **LIST PRICE:** $59.

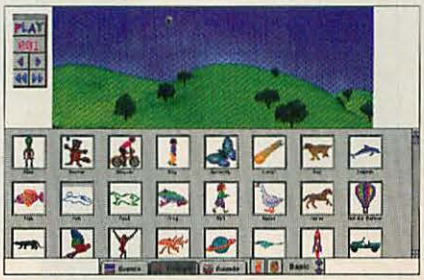
MW ★★★

AMAZING ANIMATION BRINGS cute pictures, funny sounds, and a kid-friendly interface together in a package that lets children produce short animations or interactive presentations. Think Kid Pix meets MacroMind Director.

Of course, animation is notoriously more fun to watch than to make. For this reason the designers of Amazing Animation eschew traditional animation techniques. Instead, kids produce animations primarily by dragging "stamps" across "scenes," or backgrounds. Stamps contain mini animations that run in continuous cycles—a horse running, a bird flying, a planet spinning, and so on. As the child drags the stamp, the program generates animation frames by laying down successive members of the stamp cycle along the motion path.

Amazing Animation comes with 32 animating stamps and 9 background scenes (a CD-ROM version has additional clip art). You can set transitions, such as wipes or dissolves, between scenes. The program also has 55 predefined sounds, some of which loop indefinitely to provide background accompaniment. To add a sound to an animation, you simply move to the desired frame and select the sound from a menu.

The developers recommend Amazing Animation for children ages 5 to 14. Younger users will tend just to play with the canned sounds and graphics. Older or more adventurous kids can create their own backgrounds and stamps with the built-in graphics module. Children can also record sounds using the Mac's microphone.



The Stamp Collection To make an animated scene, kids need only pick a stamp, click, and drag.

The three highly computer-literate kids I tried this program on all thought Amazing Animation was pretty cool. After an hour or so, however, the youngest, at 7, seemed bored with moving the premade graphics around. After the same amount of time, his 9-year-old sister, whose designs were more ambitious, was coming up against the inherent truth about animation: producing interesting effects takes planning and nitpicky persistence. She also bumped into some of the program's limitations. For example, there's no way to flip a stamp so that the car, say, can motor right to left instead of vice versa. The teenager, a 15-year-old, had no doubts that his friends would easily be able to master the program, but judged that the interface might be a bit user-cuddly for their tastes.

The Last Word There's nothing quite like the joy of seeing one of your drawings pick itself up off the page and do tricks. Amazing Animation lets kids share that joy. The program is best suited to highly motivated kids in the 9-to-14-year-old range who have access to adult advice. If you're the sort of parent who thinks your kids are better off playing with the computer than watching TV, Amazing Animation is the sort of program that justifies that belief.
—JOE MATAZZONI

ScriptWizard 1.0

AppleScript Editor

PROS: Find-and-replace in scripts. **CONS:** No true step-by-step debugging; cannot watch variables in subroutines; slow; does not print headers, footers, or script description. **COMPANY:** Full Moon Software (408/253-7199). **LIST PRICE:** $99.

MW ★★

FULL MOON SOFTWARE'S SCRIPTWizard is the first program that attempts to improve writing and debugging AppleScript scripts—but don't expect any magic. The program, slow and riddled with small problems, barely improves on Apple's Script Editor. ScriptWizard adds debugging and find-and-replace features. Find-and-replace is rudimentary but effective. Debugging is limited to a variables watcher and step feature that are not much help.

ScriptWizard's debugging is essentially *event-by-event:* it does not step through individual lines but runs to the next line that generates an Apple event, evaluating every expression in between. This makes debugging difficult when scripts have lots of variables between Apple events. Full Moon includes a scripting addition called a pause script that acts as an Apple event. However, its name is misleading. If you use it as a break point in a long script, the script stops not at **pause script** but, unexpectedly, at the event after **pause script**. As a workaround, you can use two pause-script commands in a row. Debugging is still difficult, though, because the variable-watcher window works only with properties and with variables in the run handler, ignoring variables declared in subroutines.

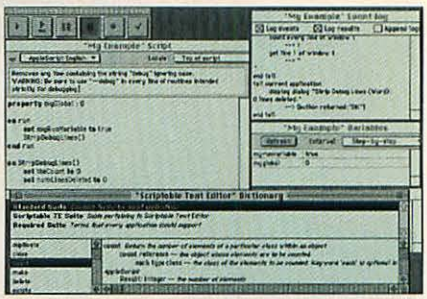
Poor performance is also an issue. ScriptWizard takes from a few seconds to as much as 15 seconds longer than Script Editor to compile a script. Simple copies, pastes, and deletes are also slow. Typing is fine—when you can see it.

ScriptWizard lets you lose the cursor in two ways: type a long line and your cursor will wiggle right off the screen; scroll up, then type, and your new text will be typed offscreen. In other words, the text window doesn't always scroll or jump to the cursor when you begin typing. No text is lost, but most users expect better.

ScriptWizard has convenient menu choices for the Finder and System dictionaries. Unfortunately, the descriptions do not use the same formatting techniques as Script Editor's descriptions.

Other problems: you can select text only by using the mouse; recompiling often shifts the current working line to another part of the screen, briefly disorienting the user; sometimes ScriptWizard does not come to the front when errors occur, leaving you wondering if the script is finished or stuck; there are no headers and footers, so you must add page numbers, script names, version numbers, and dates to scripts in comment lines or by hand, and the script's description box does not print anywhere.

The Last Word ScriptWizard does not offer the robust features of a development tool, or even all the basic features of Script Editor. Main Event's Scripter may provide a better tool when it ships near the end of the year, but for now, Apple's Script Editor works just fine.—TIM WARNER



Telling Secrets ScriptWizard includes an event log and variables-watcher window. The dictionary collapses suites in a scrolling windowpane.

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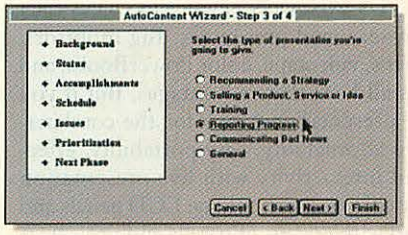

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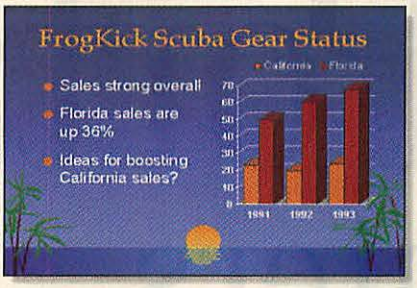

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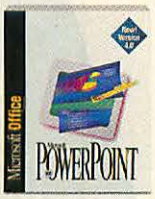

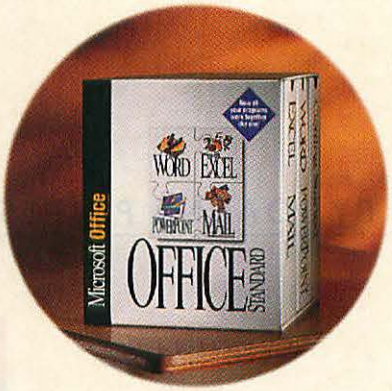

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MACWORLD LAB TESTS 11 LCD PANELS AND PROJECTORS

Portable Presenters

AT FIRST GLANCE, THE HARDWARE CHOICES FOR BUSINESS PRESENTATIONS CAN bewilder even seasoned presenters. Big monitors, television screens, videotape, color PowerBooks, and transparencies all have their advantages. But if you routinely give presentations, look for the combination of relative affordability, easy portability, effective video, and interactivity with live presentation data offered by only one technology: LCD panels and projectors. And with dozens of panels and projectors on the market, the pickings are plentiful.

An LCD panel is about the size of a PowerBook; you connect the panel to a Mac's video port, then place the panel on an overhead projector (OHP). An LCD projector combines a panel and a built-in light source, and is thus much larger than an LCD panel. Both types of products generally feature good image quality and fairly bright colors.

Macworld Lab tested 11 active matrix, video-capable (in nearly all cases, supporting NTSC, PAL, and SECAM input standards) LCD panels and projectors that cost between $3899 and $8999. Most products tested have a resolution of 640 by 480 and support up to millions of colors. Many also include sound and microphone inputs, so users can project sound from built-in speakers.

To ensure consistency in viewing conditions, we tested only products with an 8.3-inch-to-9.4-inch screen; these produce images measuring 6 to 10 feet diagonally, and work well in a medium-size conference room (they aren't bright enough for large-group presentations). Two vendors—Sharp Electronics and Dolch Computer Systems—also sell panels that have

BY JOANNA PEARLSTEIN

MW LAB

The nView Z115 (left), and the Boxlight ProColor 1500.

10.4-inch screens, which can display larger images for audiences up to about 200 people, for about $500 to $2000 more than their smaller siblings.

Panels versus Projectors

Once you've narrowed down your hardware selection to an LCD product, the choice between a projector and a panel (which weighs much less but requires an OHP) depends on your company's needs and available equipment.

Conventional OHPs are reflective—that is, the light shines from above and bounces off a reflective base—while LCD panels require a *transmissive* OHP, in which light comes from the bottom and shines through the LCD to illuminate the image. If your company already has transmissive OHPs in stock, you should probably save money and get an LCD panel.

Most LCD-panel manufacturers recommend OHPs that transmit a minimum of 3000 lumens (a measurement of light emission), though you'll need as much as 7000 lumens in a room with lots of ambient light. Be careful, though; such bright OHPs may damage the panel. Contact the manufacturer to find out what brightness level a particular device can handle. By the same token, avoid OHPs with incandescent bulbs, which can fry a panel. Metal-halide bulbs are best. Projectors tend to be brighter—one factor that contributes to a sharp and vivid projected image (see "Why Brighter May Not Mean Better").

Also consider how much you will move equipment around. Panels tend to weigh less than projectors, but you may need to bring an OHP for a panel—not to mention a computer, backup disks, PowerBook adapter, and laser disc player. The combined weight of an LCD panel and an OHP can exceed that of an LCD projector—the units we tested top out at about 25 pounds—by a wide margin (see "A Quick Look at LCD Panels and Projectors"). And beware of advertised weight estimates, as some do not include needed accessories. Most vendors sell carrying cases; quality varies, so be sure to check this before you buy.

Hard to Quantify Performance

We evaluated products based on brightness, the aesthetic quality of displayed images (as judged by a group of *Macworld* editors and designers), the ease of setup and use, relative portability, price, and technical support.

LCD panels and projectors are hard to evaluate quantitatively because measured lab results don't always directly indicate quality. And subjective appraisal relies on personal taste, which is by no means consistent. (We picked a clear winner—but to meet your own tastes and needs, preview an LCD projector or panel before buying, if possible using your own presentation images. If you regularly display a company logo or information graphic, you may want to know just what it will look like when displayed.)

Macworld Lab measured the panels' light output to determine their brightness. The lab calculated *transmissivity*—the amount of light that passes through a panel—by dividing the panel's lumens output by the OHP's lumens output. (We didn't have a constant for the LCD projectors, so we could not measure their transmissivity.) The overall difference between the brightest and dimmest panels was just over 1 percent of total light transmitted—not terribly significant.

Plus, the amount of light a device transmits does not necessarily translate into display quality. Our tests showed that Chisholm's Rainbow LCD panel transmitted the most light—ostensibly the best results—but our judges did not rate it well consistently. The Chisholm's display looked washed out, fuzzy, and too bright. Likewise, our judges rated nView's Z115 and InFocus Systems' PanelBook 530 highly, but those panels posted the lowest transmissivity scores.

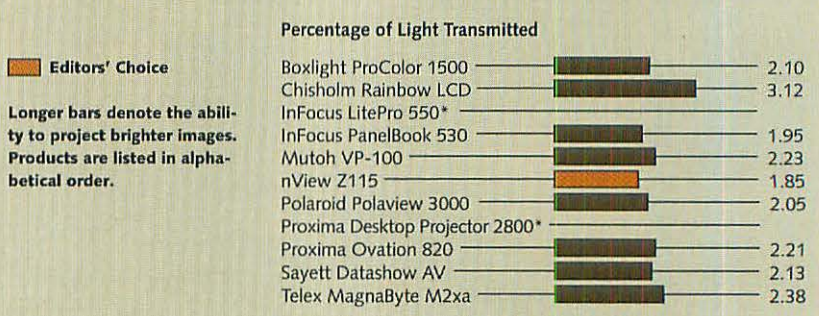
The two LCD projectors we evaluated, the InFocus LitePro 550 and the Proxima Desktop Video Projector 2800, output more light than the panels. This suggests that a common claim by projector manufacturers—that their products are brighter than LCD panels because

PRESENTATIONS CAN BE STRESSFUL EVEN WHEN THINGS GO SMOOTHLY; LOOK CAREFULLY AT TECH SUPPORT

MW LAB

Why Brighter May Not Mean Better

Although they appear clear, LCD panels block most—but not all—of the light from a projector. The more light they let through, the higher their *transmissivity*. Higher transmissivity yields brighter, though not always more appealing, images. In our tests, the brightest products appeared washed-out and fuzzy. Some panels with lower transmissivity scores had more saturated colors and sharper images.



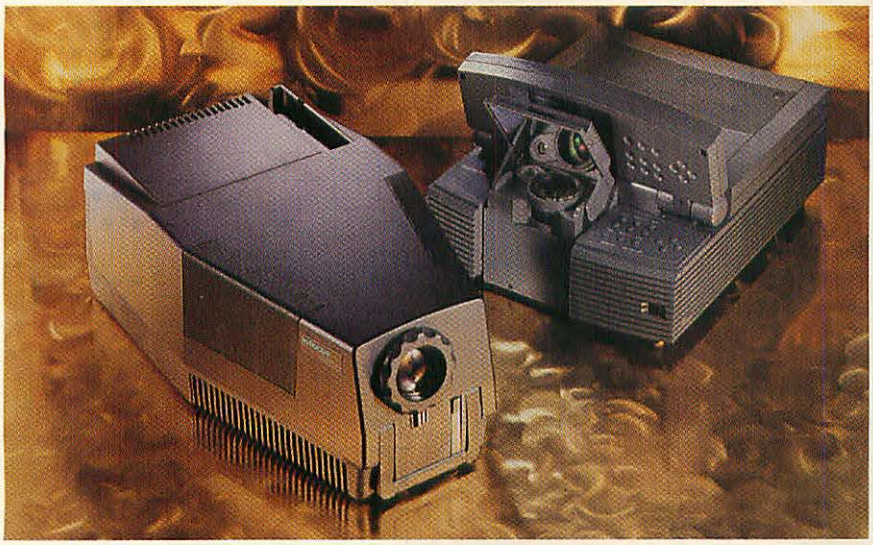
*Has built-in projector, so could not be measured.

BEHIND OUR TESTS

Macworld tested each panel's transmissivity, or the amount of light it lets through. Using a Dukane overhead projector as a constant light source and a Minolta T1 illuminance meter, we measured the amount of light (in lumens) each panel transmits and divided it by the projector's lumen output. The resulting percentage indicates panel brightness. We could not determine the transmissivity of projectors because we had no constant with which to compare the lumens output. In principle, you want a bright display; but brightness is only one measure of a panel's quality, and higher transmissivity may not mean a better display. In this case, the Editors' Choice product (the nView Z115) had the lowest transmissivity, though it was only 1.27 percent lower than the brightest panel. The nView product's superior performance was related to factors that cannot be measured quantitatively, such as color adjustments by a user to enhance apparent brightness. Remember that these devices are used in dark rooms, so the eye will adjust to their display quality. Usually, the longer you look at a display, the better it appears.—**Macworld Lab testing supervised by Matt Clark**

they customize the light source to the panel—may have some validity.

Lumens output also varies depending on where in the image you measure brightness. Our OHP was generally brightest in the vertical and horizontal centers of the display; the dimmest area was the upper right-hand corner, followed by the upper left-hand corner. This made all the LCD panels' images fade at the top. To counteract this effect, you should not place light-color or low-contrast images at the very top of the screen.



Projector Options InFocus Systems LitePro 550 (left) and the Proxima Desktop Video Projector 2800.

Display Aesthetics

Our judges evaluated products based on the appearance of colors, flesh tones, text, full-motion video, and a typical presentation-slide image. For comparison, we displayed the same images on an Apple 13-inch monitor and, for video, on a television screen.

Our judges liked the nView Z115 panel the best, followed by the InFocus PanelBook 530, saying that both products had crisp images with bright, vibrant colors. The judges were divided on the Polaroid Polaview 3000 panel: some rated it the best, calling its display vibrant, clean, and sharp; and some rated it the worst, saying it was faded and blurry, and had jumpy, banded video.

Aside from differences in personal taste, this inconsistency may be partially due to the type of images used (some units do well with text, while colors appear relatively lifeless), the position of the controls, or the darkness of the room in which images were displayed. (We displayed static images in a large conference room with a small amount of ambient light; we displayed the videos in a small room with practically no ambient light.)

Our judges did agree on the mediocre image quality of some products. Mutoh America's VP-100 displayed washed-out images and had some ghosting (the appearance of a faint second image behind a primary image), while Telex Communications' MagnaByte M2xa produced dull, faded, and soft-edged images. Boxlight's ProColor 1500 is a modified version of the Telex product, and while the MagnaByte M2xa transmitted more light than the Boxlight, our judges liked the Boxlight better. Sayett Technology's Datashow AV had accurate colors, but images looked washed out and grainy.

The Proxima Desktop Video Projector 2800 had insufficient color contrast and suffered from a noticeable shift in brightness from top to bottom. We found that the Proxima products required a lot of adjustment to produce adequate results, and in some cases we had trouble getting rid of a green cast on the images. Video on the Desktop Video Projector 2800 appeared jumpy and slightly blurry. InFocus's LitePro 550 looked washed out and had noticeable banding and flicker in our testing. The LitePro 550 also got very hot while in use; remember to let it cool before transporting it.

While most panels support 24-bit color, bear in mind that a panel or projector can display only as many colors as your CPU can handle, so without a video card installed in the Mac, you're limited to 8- or 16-bit color. And a larger color palette doesn't necessarily mean a better picture: the two products whose projected images we liked best, the Z115 and the PanelBook 530, have a smaller color palette than other LCDs. The PowerBook 540c, Duo 270c, and Duo 280c can produce 16-bit color at 640 by 400 resolution. If you're planning to run your presentation from one of these PowerBooks at the higher resolution, adjust your presentation file to account for the fact that the bottom of the image will be cut off.

Ease of Use

You can often improve display quality by adjusting brightness, contrast, and tint on LCD panels and projectors. Most products feature both controls on the device itself and remote controls that let the user change display qualities, image orientation, and media source. Most remote controls are easy to use and understand, with the exception of the InFocus unit's—several of its menus were hard to navigate and exit, and in one case we had to call technical support to make the product work. (Before you buy any of these devices, try adjusting the controls.)

There are few controls on the Polaroid product; if you lose the remote, you lose the ability to adjust display, video source, and image characteristics. At the opposite extreme, nView's credit card–size remote only lets you move within a presentation file and adjust speaker volume. Its large buttons make it easy to operate in the dark, however.

Many products also contain stereo speakers, but don't be fooled; if sound is an integral part of your presentation, bring portable speakers and connect them directly to your Mac. Sound inputs on the Boxlight and Telex products were difficult to use; because the sound-input port is poorly constructed, the cables kept falling out of the sockets, leading to radically reduced sound volume or total silence. We had to hold the cables in manually to make the sound audible, although when we *could* hear the sound, quality was good.

Besides including remote controls and stereo speakers, some vendors offer devices to help users control or modify their presentations. Chisholm's Rainbow LCD panel includes a drawing tablet that lets you write on the displayed image. Proxima sells a wand called the Cyclops ($495), a 3-foot-long pointing device that serves as a remote mouse, and a smaller device, the Laser Pointer ($295), which serves the same function.

InFocus sells a LiteShow option ($750 for its PanelBooks or $1000 for the LitePro series) that lets users make computerless presentations. You print your slide show to a LiteShow printer driver, place the file on a DOS-formatted disk, and place the disk into the disk drive on the LiteShow-enabled panel or projector. This is a nice option, but Macintosh users may not like the DOS-formatting requirement and may be more comfortable with the control that running a presentation from a computer provides.

A Quick Look at LCD Panels and Projectors

Company	Phone	Toll-Free Phone	Product	Price	Projector or Panel	Tested by Macworld Lab	Video Support (NTSC/PAL/SECAM)
Apollo	516/467-8033	800/777-9750	Vision 262K LCD Panel	$4795	panel	○	●[B]/○/○
			Vision Q2 LCD Panel	$6543	panel	○	●/●/●
			Vision Q3 LCD Panel	$6999	panel	○	●/●/●
Boxlight	206/779-4479	800/497-4008	ProColor 1300	$2999	panel	○	○
			ProColor 1500	$3899	panel	◐	●/●/●
			ProColor 2100	$6599	projector	○	●/●/●
Chisholm	408/559-1111	800/888-4210	Rainbow LCD	$5995	panel	◐	●/●/●
Dolch Computer Systems	408/957-6575	800/538-7506	Prism 1150	$5495	panel	○	●/●/○
			Prism 1650	$6995	panel	○	●/●/●
Dukane	708/584-2300	○	MagniView 850	$5995	projector	○	●[B]/●[B]/●[B]
InFocus Systems	503/685-8888	800/294-6400	LitePro 540	$7499	projector	○	●[B]/●[B]/●[B]
			LitePro 550	$8999	projector	◐	●/●/●
			PanelBook 525	$4799	panel	○	●[B]/●[B]/●[B]
			PanelBook 530	$5299	panel	◐	●/●/●
			PanelBook 550	$5799	panel	○	●/●/●
Mutoh America	708/952-8880	○	VP-100	$3995	panel	◐	●[B]/●[B]/●[B]
nView	804/873-1354	800/736-8439	Z110	$4995	panel	○	○/○/○
			Z115	$5495	panel	◐	●/●/●
			Z210	$6495	panel	○	○/○/○
			Z215	$6995	panel	○	●/●/●
Panelight Display Systems	415/772-5800	800/762-3599	ZX	$3695[C]	panel	○	●/●/●
Polaroid	617/386-9857	800/816-2611, ext. 970	Polaview 3000	$5995	panel	◐	●/●/●
Proxima	619/457-5500	800/447-7694	Desktop Video Projector 2800	$8995	projector	◐	●/●/●
			Ovation 820	$4695	panel	◐	●/●/●
			Ovation 822	$5995	panel	○	●/●/●
			Ovation+ 840	$4995	panel	○	○
			Ovation+ 842	$5695	panel	○	●/●/●
			Ovation+ 846	$6695	panel	○	●/●/●
Sayett Technology	716/264-9250	800/678-7469	Datashow AV	$5245	panel	◐	●/●/●
Sharp Electronics	201/529-8731	800/237-4277	QA-1100	$4795	panel	○	●[B]/●[B]/●[B]
			QA-1500	$5795	panel	○	●/●/●
			QA-1650	$6295	panel	○	●/●/●
			XG-E850U	$9995	projector	○	●/○/○
			XG-H440U	$4695	projector	○	●/○/○
			XV-P10UP	$1995	projector	○	●/○/○
Telex Communications	612/884-4051	800/828-6107	MagnaByte M2xa	$5195	panel	◐	●/●/○
3M	○	800/328-1371	6450	$5495	panel	○	●/●/●

● = yes; ○ = no; NA = not applicable. *Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, rating. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests.* [A] *Combined weight of products, cases, and necessary accessories.*

Sharp Electronics' QA-1500 panel lets you store presentations on Type III PCMCIA cards. This will be appealing when Macintosh drivers for PCMCIA cards emerge over the next few months.

The Support You Deserve

Making presentations can be stressful enough when things go smoothly; when you have problems, it's critical that your vendor supply easy and effective assistance. We tested the quality of each vendor's technical support by calling with commonly asked questions. Boxlight, InFocus, nView, and Proxima had the best technical support. The worst performers were Mutoh America, Polaroid, and Telex Communications.

In the case of InFocus, technical support came in handy because we had a problem with the remote controls. The InFocus manual is also a little confused when it comes to the Macintosh: it says the product is not compatible with "the Macintosh laptop" but is compatible with Mac PowerBooks. InFocus meant the Mac *Portable*, but that statement could easily instill great fear in a PowerBook user. The English portion of the nView Z115 manual has much less information than most other products' manuals.

Setup Advice

You can often get around relying on tech support by avoiding common pitfalls. When using an LCD panel with an OHP, make sure the room is well ventilated. In our tests, the OHP kept shutting off because it overheated. If you're presenting in a hot room, your OHP may spontaneously shut down at the worst possible moment. Heat causes another problem—an OHP or LCD projector's cooling fan can be noisy, so be prepared to speak loudly, use a microphone, or increase the volume in your presentation file.

To get your presentation to appear both on your PowerBook screen and on your LCD, you must turn on video mirroring in the PowerBook Display control panel—and, of course, you need a PowerBook video adapter. You may be tempted to display your images on a blank wall, particularly in rooms that are too small for the audience. Don't do it. You'll get a better picture if you project onto a beaded, rather than matte or lenticular, screen.

Alternative Devices

Although we tested only active matrix panels and projectors, screens for LCD presentation panels also come in the passive matrix variety. Active matrix panels do a much better job on video. They are also brighter and display sharper images than passive matrix panels; not surpris-

Mac Adapter	Maximum Colors Supported	Screen Size	Built-in Speakers	Weight [A]	Technical-Support Rating
built-in	262,144	8.5"	○	not tested	not rated
built-in	16.7 million	8.5"	○	not tested	
built-in	16.7 million	8.5"	●	not tested	
included	624,000	8.4"	○	not tested	excellent
included	16.7 million	8.4"	●	9.1 lb	
included	16.7 million	8.4"	●	not tested	
included	16.7 million	8.3"	○	12.1 lb	acceptable
costs extra	185,000	8.4"	○	not tested	not rated
included	16 million	10.4"	○	not tested	
included	2 million	8.4"	○	not tested	not rated
included	1.4 million	8.4"	●	not tested	excellent
included	1.4 million	9.4"	●	23.7 lb	
included	1.4 million	8.5"	○	not tested	
included	1.4 million	8.5"	○	9.8 lb	
included	1.4 million	9.4"	○	not tested	
included	185,195	8.4"	●	20.8 lb	unacceptable
built-in	1.4 million	8.4"	●	not tested	excellent
included	1.4 million	8.4"	●	9.8 lb	
built-in	16.7 million	10.4"	●	not tested	
built-in	16.7 million	10.4"	●	not tested	
built-in	1.4 million	8.4"	○	not tested	not rated
included	16.7 million	8.4"	●	14.8 lb	poor
included	2 million	8.4 "	●	24.5 lb	excellent
included	2 million	8.4"	●	9.6 lb	
included	2 million	10.4"	○	not tested	
included	16.7 million	8.4"	○	not tested	
included	16.7 million	8.4"	○	not tested	
included	16.7 million	9.4"	○	not tested	
included	16.7 million	8.4"	●	21 lb	acceptable
included	16.7 million	8.4"	○	not tested	not rated
included	1.7 million	8.4"	●	not tested	
included	16 million	10.4"	○	not tested	
costs extra, from third party	16.7 million	3.3"	●	not tested	
costs extra, from third party	16.7 million	3.3"	●	not tested	
costs extra, from third party	16.7 million	3.6"	●	not tested	
included	614,000	8.4"	●	10.1 lb	poor
included	16.7 million	9.4"	○	not tested	not rated

ınd accuracy of the company's support technicians. Macworld uses a point system, including bonuses and demerits, to derive the final
With extra-cost video adapter. [C] *For video-capable unit; data-only unit costs $2995.*

ingly, they're also much more expensive.

If you'll be presenting in a place where you can't dim the light significantly, stay away from LCD panels and projectors of any kind. Ambient light greatly affects the display quality of these products. In that case, a computer or television monitor is a better choice. Extralarge computer monitors have decent display quality, and they're a good choice for companies that frequently host presentations. These monitors are expensive, however, and definitely not portable—some weigh more than 250 pounds.

Another alternative is a scan converter, which lets you display your computer's video on a television screen (see *The Desktop Critic*, in this issue). Image quality improves as price increases—from $400 up to $24,000. Unfortunately, affordable scan converters provide mediocre display quality at best. Televisions make bad computer monitors because of their low resolution; computer images displayed on a TV tend to look fuzzy and flickery.

The cheapest presentation solutions are good old transparencies and slides, which won't wow the audience with your technical wizardry but may do the job just fine. If you make presentations infrequently or rarely, investigate transferring your presentation to videotape and displaying it on a television. This won't allow you to interact with your data, but it is certainly cheaper and simpler.

The Last Word

Panels and projectors are mostly sold through distributors specializing in audiovisual equipment, and you can expect the same sort of discounts from suggested retail prices on these products as on other Macintosh hardware. (Be sure to ask the company about its policy on exchanging panels with voided pixels, in case you buy a substandard unit.) But beware of hidden costs. Many LCD panels and projectors let you plug directly into a video source, such as a laser disc player. Others require an optional adapter, which can run from $895 to $1600.

The base prices of products that require an adapter tend to be lower, and these products can be a good choice if you're not sure you need video capability. In many cases, adding an adapter pushes the price close to that of a video-capable product. If you know you need video, get the video-ready product so you don't have to carry around an adapter. But you don't need a video-capable LCD to display QuickTime movies; the video capability doesn't affect the display quality of digitized video—the type of screen does. If all your video is digitized, save the money and get a panel without that capability—don't pay for features you won't use.

Some industry analysts predict that projectors may eventually replace panels, since their all-in-one design can be easier to use. But we were not terribly impressed with the projectors we saw, and the better units cost much more than panels of comparable quality.

Among the panels, our judges rated nView's Z115 highly, and the company has excellent technical support. The product is also easy to set up and adjust, and at $5495 it's reasonably priced, making it the best choice for serious business presenters. For a good economy buy, try the Boxlight ProColor 1500. This unit's visuals are less vivid and clear, but at $3899 it's a light, versatile bargain from a company that also offers excellent tech support. With either choice, you'll be on your way to a great show. **m**

Macworld assistant editor JOANNA PEARLSTEIN frequently contributes to the *Reviews* and *News* sections of the magazine.

LCD PANELS

MW EDITORS' CHOICE

In a crowded field with several strong contenders, we tested for the strongest combination of display quality, ease of use, and customer support.

Z115 Elegantly designed and offering crisp display quality, the Z115 weighs less than 10 pounds and comes with excellent technical support. **Company:** nView. **List price:** $5495.

PUBLIC-SPEAKING TALES OF HORROR

AND HOW TO AVOID THEM

PANIC

On The Podium

BY DAVID POGUE

Murphy's Law says that whatever can go wrong will go wrong. Presentation veterans say Murphy was an optimist.

You've got just one chance to give a perfect live presentation; it's about the only Mac-based creation you can't edit as you go. Therefore, the key words are *preparation* and *rehearsal:* prepare like crazy, and rehearse the presentation as if it were a Broadway show.

First, consider the equipment. Your own Mac has taken you months to customize, enhance with fonts, troubleshoot, and so on. That's why trusting somebody *else's* Mac—such as a rental—to work the first time, under pressure, is sheer folly. Most pros use their own equipment in presentations, or at least they start up from their own hard drive or SyQuest cartridge. Rehearse the equipment, too—not in your hotel room, but in the actual presentation room—so you'll be prepared for unexpected environmental hazards like dead outlets, burned-out projector bulbs, and noisy air conditioning.

Second, rehearse the people. Presentation veterans tell chilling tales of speakers unexpectedly blinded by the lighting—or by darkness—on the podium; of presenters who jump ahead in the speech so that the slides no longer correspond to it; and of course, of speakers who simply aren't good speakers. You can still make a good pitch if the equipment plays dead on the day of the show, but you can't make a good pitch without a good presenter.

Need convincing? Here are a few true tales from the trenches—along with the lessons worth learning. (Some of the names have been changed to protect the innocent.)

Front and Center

Greg O'Connor, a telecommuting consultant, was too smart to rent equipment for his important talk in Houston. He created his show at home using Gold Disk's Astound presentation program and his own Centris 610, which he then lugged to the meeting.

Contrary to what you might expect, however, Greg paid dearly for his decision to use his own Mac. About halfway through his talk, his calendar program, Now Software's Now Up-to-Date, threw a huge dialog box onto the two giant 27-inch monitors. It was a reminder Greg had set for himself, making its appearance exactly as programmed.

Worse, the text of the reminder was there, in all-capital letters, for the entire audience to see. It was Greg's note to make a certain purchase on the way home from the talk—a feminine-hygiene product for his wife.

Moral: (1) Load only absolutely necessary extensions and control panels onto the Mac you'll use. (2) Learn to adapt to a little unexpected humor in any presentation.

PowerBook Draws a Blank

"No pressure," muttered George Clar, research director for a major magazine. He was about to deliver his annual sales pitch to 200 advertisers. The hotel ballroom contained a movie screen, a PowerBook 180, and an LCD projection panel. With 15 minutes to go, George still hadn't succeeded in getting either the PowerBook or the projection panel to work; both showed nothing but gray blankness when connected. George had tested everything at the office—but now, despite a million restarts and cable checks, neither gadget would behave.

Just as George began contemplating a career in the rewarding field of refrigerator repair, he discovered a clue: the PowerBook screen had a *menu bar*. There weren't any menus in it, but the white strip was visible. With morbid curiosity, he slowly rolled the trackball horizontally, farther and farther, until at last, sure enough, the arrow pointer sallied nonchalantly onto the PowerBook screen.

From there, it took George only moments to solve the puzzle. Somehow, in his Monitors control panel, the LCD panel had been selected as the main screen (video mirroring was turned off). Therefore, the PowerBook's screen was serving as the right-side extension of the LCD panel! Why, then, didn't the projection panel show the familiar world of icons and windows? Because its contrast knob had been bumped in transit, turning all its pixels dark, as sometimes happens with these panels. George turned the dial and blissfully found his waiting presentation files with only a minute to go.

Moral: The Monitors control panel is the most cherished software possession of a Mac-based presenter. Learn it, understand it, and experiment with multimonitor setups—*before* you're surrounded by 200 waiting spectators.

When Four Backups Aren't Enough

Dave Mandala, of Them Productions, has been in business masterminding multimedia productions for decades. Over and over again, he's learned the importance of having a backup of everything, no matter what the cost. So when he planned a multiscreen presentation in Hungary in 1991, he shipped himself 12 monitors instead of the 8 he actually needed.

When he arrived in Budapest, however, he opened a metal-framed, densely padded shipping case, and a gallon of water splashed onto his feet. Horrified, he tried the next case . . . and the next. The contents of the shipping cases were completely soaked; the Hungarian airline staff had left the cases on the runway overnight during a downpour. Only four monitors were dry enough to operate—those that had been stacked on the bottom.

Dave had allowed himself three days to prepare for the show—and he needed them. With difficulty in resource-poor Budapest, he purchased several gallons of isopropyl alcohol and a hair dryer. Then he set to work dismantling the monitors, pouring alcohol over their circuit boards and drying them with the blow-dryer. He finished reassembling the monitors the morning of the show; incredibly, he managed to revive four monitors, giving him the eight he needed. When he switched them on, one monitor self-destructed with a brilliant flash. The show went on with only seven screens—but it did go on.

Moral: Overseas presentations are twice as scary. As Dave discovered, knowing somebody who can translate (a cab driver he met) is imperative in times of stress. And of course, not having backup equipment is folly.

PREPARE LIKE CRAZY; REHEARSE AS IF FOR A BROADWAY SHOW

One Hot Presentation

Danny Cooper, a computer consultant for stage productions, was supposed to deliver a talk to a national convention of theater producers in Baltimore. He checked and tested the rental setup (Quadra, LCD projection panel, and overhead projector) several times in the actual auditorium. Everything worked.

The presentation began well. The audience was rapt, and the Mac images looked sensational on the big pull-down movie screen—at first. But to Danny's increasing horror, the LCD panel's images grew fainter and fainter as his talk proceeded. After 20 minutes, the panel projected pure white, and no amount of fiddling with the contrast dial improved matters. He had no choice but to turn off the system and finish the talk using his hands as the only visual aid.

Moral: Had Danny rehearsed his *entire* presentation, he'd have discovered that LCD projection panels overheat unless they're used with modern overhead projectors containing halogen or metal-halide bulbs. Older overhead projectors (such as those still used in many schools) contain high-wattage incandescent bulbs that will bake your projection panel.

LCD: Liquid Crystal Desperation

Jenny Harris, a graphic-design consultant, was supposed to demonstrate System 7.5 for a large user group. She'd loaded the system onto her own hard drive, which was hooked up to the user group's onstage Mac. Yet the rented projector showed nothing but fuzz; apparently, System 7.5's Monitors control panel was incompatible with the video-interface equipment. Her choice: run System 7.1 and have a projector, or run System 7.5 as a private showing.

Thinking fast, Jenny saw one of the user-group members holding a camcorder. She suggested that the techies connect *it* to the video projector, so somebody could simply point the camera at the Mac monitor and project the image for all to see.

That worked—sort of. Trouble was, highly distracting, rolling horizontal lines appeared in the projected image. (These lines show up anytime you use a TV-type camera to record a CRT monitor's images.) Jenny's breakthrough solution: she borrowed a PowerBook 520c from a guy in the front row, connected her hard drive to it, and pointed the camera at the *PowerBook's* screen. Because it wasn't a CRT monitor, there were no rolling lines—and no unhappy spectators.

Moral: If you haven't tested the equipment before the show, you're courting disaster—but quick thinking is the best defense.

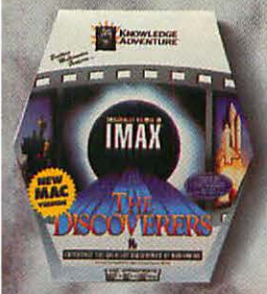
John Sculley's Near Miss

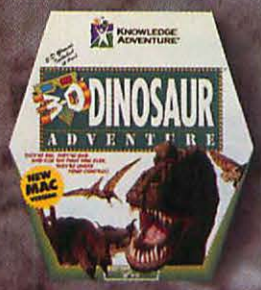
Raymond Nasr, an executive speechwriter at Apple Computer, tells of the night John Sculley, then CEO of Apple, was to deliver a crucial speech to an audience of 1200. After the morning's final rehearsal—one of many—Sculley left his speech notes on the podium, carefully arrayed and ready to read. After the audience was seated and the lights were dimmed, a woman walked onstage and welcomed the crowd. Raymond watched in panic backstage as the woman then picked up her speech notes *—along with Sculley's*—and left the stage.

As a second speaker began to introduce Sculley, Raymond scrambled into the audience, chasing the woman, who was now buried somewhere in the crowd. He cornered her at last. "You've got the chairman's notes," he exclaimed; turning white, she handed them over. Raymond bulldozed his way to the front of the stage just in time to hand the speech notes to Sculley, who was in mid entrance. The presentation proceeded without a hitch.

Moral: No matter how many times you rehearse, no matter how perfect the equipment, the ghost of Murphy can strike. Raymond's primary advice: be alert not just to the equipment, but also to the people and the environment. And if the presentation follows a meal, bribe the waiters to stay away from the tables during the speech. The absence of dinnerware clanking is worth every penny. ■

Contributing editor DAVID POGUE is coauthor of the Macworld Macintosh Secrets 1995 Calendar, a tip-a-day desk calendar (Andrews and McMeel).





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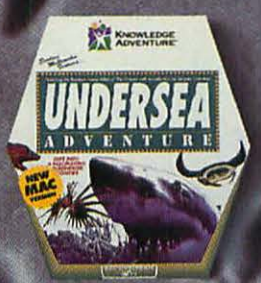

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LET THE GAMES BEGIN
SOLI
GLORIA

BY STEVEN LEVY

1994 MACINTOSH

GAME HALL of FAME

It was closing in on 3 a.m. when I finally called the meeting to a halt.

"We aren't getting anywhere," I told the categories committee of the Macintosh Game Hall of Fame, casting stern glances around the conference table. "We're going to have to end this session and do what we always do when it comes to categories—hang a little loose."

The committee members hardly seemed to hear me. One had booted up SimCity 2000 on a PowerBook and several had gathered around it, suggesting locations for the power plant. I walked over, elbowed the kibitzer aside, and wiped out the settlement with a tsunami.

"Look here," I cried. "This is a tough business, and I know we're all tired. We've spent months loading disks into Mac II's, Performas, and Power Macs. We've explored dungeons, pyramids, haunted houses, and fantasy islands. We've flown so many F-16s that we see heads-up displays in our dreams. We've shot enough aliens to win a Senate race in California. As curator of the Mac Game Hall of Fame, I say it's time to call it a day. I've had it. Let's go home."

"Does this mean no separate Power Mac category?" Finster asked. (He's got an 8100.)

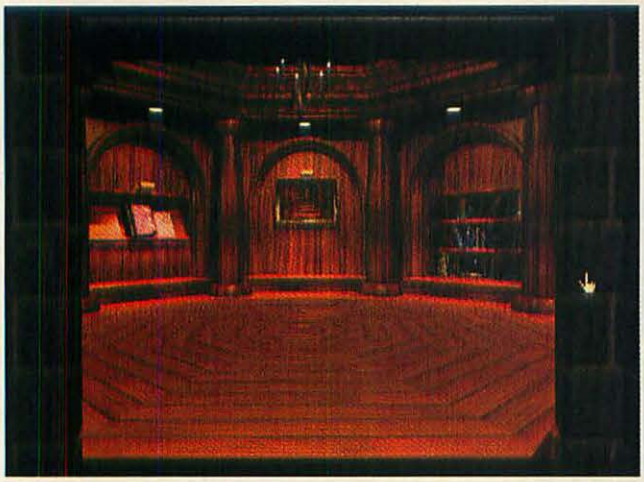
"I told you, we ruled it out because we finally decided that all our games should run on the Power Mac. We'd like to acknowledge great upgrades to existing games, but if they're already in the Hall, Power Mac people will find them."

"Are we really going to lose the CD-ROM category?" asked Sneed. His uncle donated the cash for our New Media wing, so he has an interest in the subject.

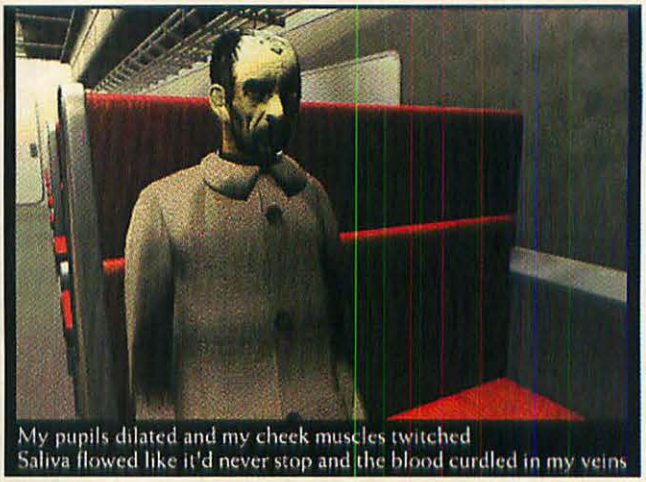
"We'll have to," I answered. "Adventure games hardly come on floppies anymore, and soon more than half our games will probably come on CD-ROM. Even shoot-'em-ups are going CD. Look at that *Star Wars* game, Rebel Assault."

"I still think we should have picked that one as a winner," said Ricksecker, a trustee who's seen *Return of the Jedi* 14 times.

"Sorry," I said testily. "We decided any game that was unplayable without a joystick couldn't get in. But that's not the point. Categories aren't even the point. What's the difference between adventure and role-playing? Between role-playing and strategy? Strategy and brain game? Brain



Myst A view of the library from the fireplace. And why are you in the fireplace? To solve another puzzle in the most absorbing adventure game since the genre was invented.



Gadget This charming fellow—and so fetchingly dressed!—is a colleague of the mysterious scientist you are hunting in this game. You meet him on a Hitchcockian train and quickly develop vertigo.

game and arcade? *It doesn't matter.* All that matters is greatness. That's what we're here for, isn't it?"

I had finally silenced the group—no mean trick considering that just about every member has a serious case of attention deficit disorder (not surprising in a collection of computer-game addicts).

"Look, when a game author designs a product, he or she shouldn't be constrained by what category it's in. The idea is to make it great. And that's the idea here at the Macintosh Game Hall of Fame—to identify and honor greatness. The ten we picked this year are tagged with categories, but that's more for purposes of identification than to imply that a game fits in only one place."

There were a couple of nods of assent. "I know that there are more games out for Windows than for the Mac," I continued. "But the Mac games are trendsetters. They're special. And the very best of them always wind up here, in the hallowed halls of our Pittsfield, Massachusetts, facility. Final choice, of course, is determined by a highly subjective but ultimately infallible curator. We're a tradition. Entry into the Macintosh Game Hall of Fame is the ultimate honor, and the Class of 1994 is a terrific one."

"So what were the final choices?" asked Ricksecker.

"I'm glad you asked."

BEST ADVENTURE GAME

MYST

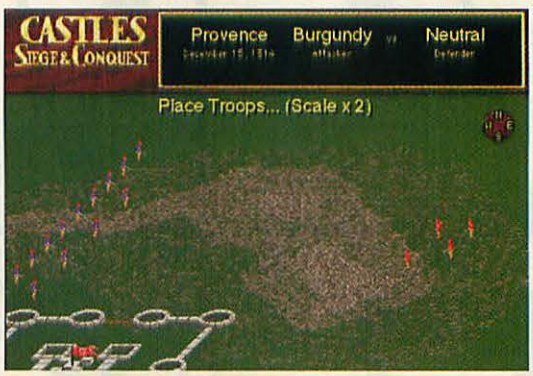
Brøderbund Software, 415/382-4600; $59.95.

The first few frames of Myst—the sunken boat by the dock on the mysterious island, the gear house on the hill, the weird box with the now notorious marker switch on top—are destined to become part of gaming history, ranking alongside the opening words of the first adventure game, Crowther and Woods's Adventure.

Myst is that rare game that doesn't just push the envelope, it shreds it. Gone are the most annoying parts of adventure games—vocabularies that don't understand you, people you can't talk to, wrong moves that get you killed and make you start over. You try to unravel the enigma of the island by exploring the island, but there's no time pressure to distract you, no arbitrary punishments put in your way. You can linger to take in the sights and sounds—which are gorgeous and universally intriguing.

The brothers Rand and Robyn Miller, whose earlier The Manhole and Spelunx only hinted at greatness, have masterfully provided the framework to create the illusion of a fully fleshed-out alternate world. It's easy to get lost in Myst, but it's not impossible to find your way to a solution. You have to familiarize yourself with the books in the library, check that seat that looks like a dentist's chair, and really get to know your tower. And a story will emerge—one that promises to have some fascinating sequels.

That's for later. Right now, if you have the slightest interest in adventure gaming, you will run out and buy this disc. If you own a CD-ROM drive, you've probably already bought Myst. And if you don't have a CD-ROM drive, well, now there's a compelling reason to buy one.



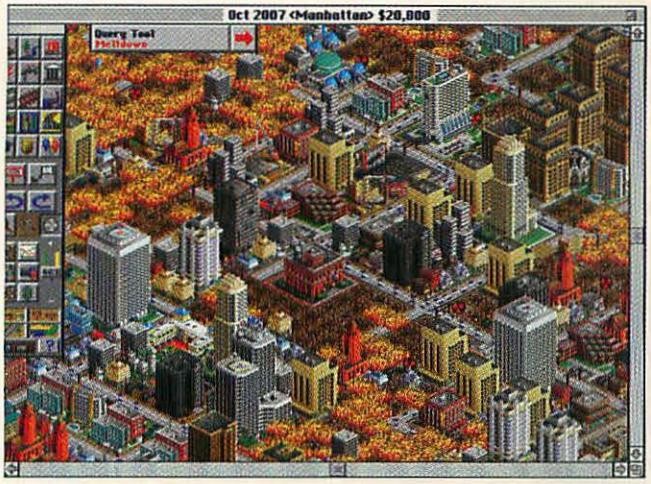
Castles: Siege & Conquest You, as Burgundy, are having a bad year—1314, to be exact. Your subjects in Provence have revolted, even before your castle is built. So now you reclaim the turf with your warriors. Fortunately, you outnumber them, and a massacre ensues.

BEST MULTIMEDIA GAME

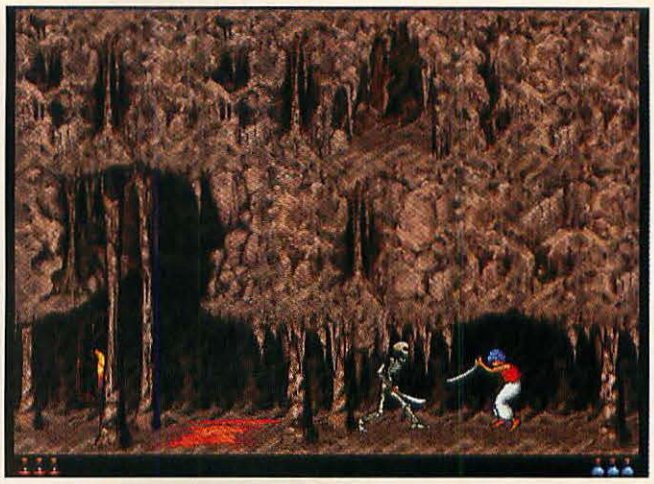
GADGET

Synergy America; 213/687-2905; $79.99.

If Myst has a Tolkienesque mystery and wonder to it, Gadget is sort of a weird mix of Dennis Potter, Alfred Hitchcock, and the dream sequence in "Twin Peaks." In theory, the goal of this psychological thriller is to find a scientist named Horselover. But the real point is simply to experience the gestalt of the vaguely pre–World War II, London-ish universe, hauntingly rendered by director Haruhiko Shono and spookily enhanced by the music of composer Koji Ueno. The look-and-feel is awesome, and the technology behind it prevents the limitations of the CD-ROM from dampening the effect as you navigate this strange world. Interspersed throughout are eerie, black-and-white QuickTime segments. The people you meet are truly bizarre and apt to come up with statements like "To a metallic



SimCity 2000 Gee, we knew we shouldn't have put that nuclear power plant in the middle of Manhattan. Now there's been a meltdown, and it's another bad day in New York. Good thing it's only SimCity 2000.



Prince of Persia 2: The Shadow & the Flame After negotiating the beach on the desert island, the disenfranchised prince makes his way down a series of hostile caves, only to encounter a sword-bearing skeleton. En garde!

whine, the pain drilling through my skull, I began slowly to drift into unconsciousness." Oh, really?

How strange do things get in Gadget? Let's put it this way: at several places in the game, you may well feel like you're levitating. This is the game to show your friends when they say multimedia is a bore.

BEST STRATEGY GAME

CASTLES: SIEGE & CONQUEST

MacPlay, 714/553-6655; $59.99.

What better use for a computer than to immerse you in the heart of the Dark Ages? You are one of several powerful lords in medieval France. If you acquire enough territory and become sufficiently rich and powerful, you may one day be king. To do this, you must maintain the local economies of the provinces you control, keep good relations with most of your rivals, knock off the other rivals, and above all, make sure the pope likes you. (Every so often, you'll have to slip him some costly indulgences—but remember, he's the one who crowns the king.)

The key to your domain is the castle. You can either create your own or use a preexisting design. But how you design is important, because you can count on someone laying siege to your keep. One of the more depressing parts of your day comes when you are caught shorthanded, with an insufficient number of defenders facing a horde of invaders who are armed with catapult and battering ram, ready to grind your dreams of kingship to dust.

There are several absolutely priceless aspects to the game. One involves the rather comical (at least the first few times) little movies that pop up on the screen at crucial moments. Another is the ability to send saboteurs and spies into neighboring provinces. It's a great feeling when one of your soldiers swipes gold from a rival. More significantly, you can actually command your troops. This requires some research into medieval combat. Thankfully, unlike some other strategy games, Castles: Siege & Conquest doesn't require a master's degree in history to play a decent game. But the more you play, the more you'll want to learn about life in 1314—the better to ascend the throne.

BEST SIMULATION GAME

SIMCITY 2000

Maxis Software, 510/254-9700; $69.95.

The original SimCity is a very tough game to top. But SimCity 2000, by maintaining a low learning curve, manages to keep the spirit of its predecessor, while greatly enhancing the detail. Borrowing some of the more elaborate screen displays of A-Train (another Maxis game), Will Wright and Fred Haslam have conspired to make you a very powerful—but not omnipotent—mayor of a city of your own design (or one of the included cities). Enhancements include a water infrastructure, universities, libraries, prisons, and hydroelectric plants. You can construct truly amazing metropolises.

But as in the original, the real meat of the game is dynamic interaction. From the interplay of forces—what you want to build, what your citizens want, and what nature (including human nature) will allow—emerges a city. As your efforts at construction will teach you, anticipating consequences is key. But sometimes you can't avoid the Sim-urban version of the butterfly effect known in chaos theory (a butterfly flapping its wings in Singapore so profoundly affects meteorological events that a thunderstorm erupts in Kansas). Forgetting to put a police station near a residential neighborhood, an overreliance on auto transportation, or spending too much on a stadium could eventually lead to dire consequences. An increase in property taxes might contribute to riots in the streets.

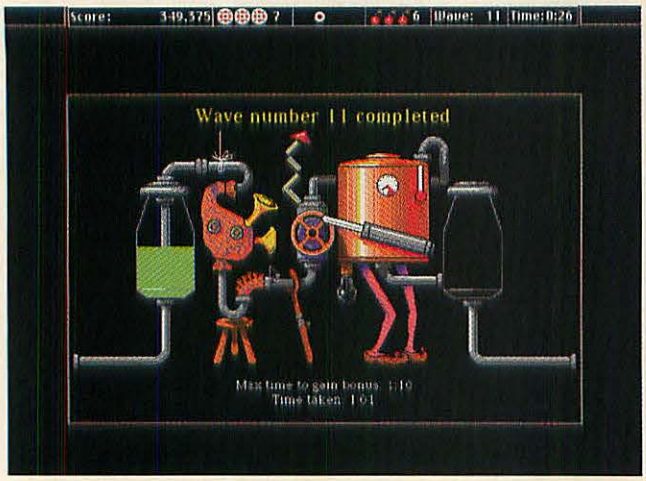
But the fun is still there, particularly in SimCity 2000's cheerful appeal to nihilism. Lurking under the menu bar is the option to invoke a number of disasters that allow you to damage your empires in entertaining ways. If that isn't enough for you, Maxis offers (for an additional price) a group of famous actual or would-be disasters. You can replay Hurricane Andrew in Homestead, Florida; launch riots in the streets of Washington, D.C.; or sit smugly in your electronic cottage while a microwave-beam disaster wipes out Silicon Valley. Am I a wrathful god? You betcha!

BEST ARCADE GAME

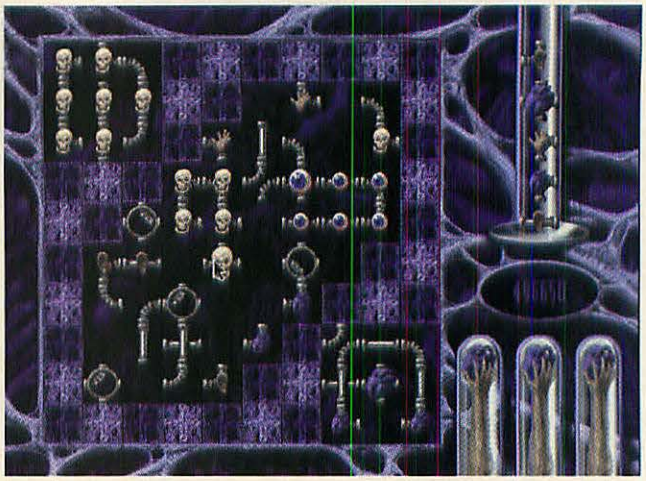
PRINCE OF PERSIA 2: THE SHADOW & THE FLAME

Brøderbund Software, 415/382-4600; $39.95.

Again, a sequel manages to add layers of complications, while preserving the excellence of the original. Only now does it dawn on us that the prince is really Aladdin, though this is never overtly mentioned (perhaps to stave off evil magic from the omnipotent empire of Disney). Still, this might have been called The



Crystal Crazy This odd device for awarding bonus points provides a rare respite from the barrage of weird foes that attempt to eradicate you while you gather crystals, build jigsaw puzzles, and smash household obstacles against walls.



Troubled Souls The point is to make rings out of little puzzle pieces with, well, body parts attached. The pieces drop from the chute on the right. This is toward the end of the game, when space is scarce.

Revenge of Jafar: the evil vizier contrives to get our prince banned from the kingdom, and your task is to fight about a billion nasty swordsmen (who get fiercer as you pass through the levels), try out some magic, toss some fireballs, and move your prince-figure in all sorts of imaginative ways to get through the mazelike complications that have charmed the fans of games from Lode Runner to Super Mario.

The game controls work very well, and fairly simple keyboard commands elicit elaborate responses from your prince. And the visuals are tremendous—you go from waterfront to cavern to palace, with all sorts of interesting obstacles in between. But what really elevates Jordan Mechner's sequel is that it augments the duck-slash-jump movements of an arcade game with a mildly baffling series of challenges. On each level you have to figure out the right path to take and the proper sequence of events. So besides being quick with your fingers, you must also be quick with your wits.

BEST SHOOT-'EM-UP

CRYSTAL CRAZY

Casady & Greene, 408/484-9228; $49.95.

Does it seem as if the Game Hall of Fame has a lot of sequels this year? Unlike with movies, the second time around for games is often better. So it is for Crystal Crazy, by Patrick Buckland and Alasdair Klyne, a shoot-'em-up so whimsical that you never for a moment think you're doing anything destructive. Yet you still get the warm, cozy, destructive pleasure that comes from mowing down vast legions of enemies in the course of collecting your crystals.

In various waves, you will attack—and be attacked by—Fracturefluffies, Pro Dupies, Wanglefoots, Yackertacks, and Rawpuscles. And of course the dread Space Cow. You fire at all of them from your happy little circle/spaceship, which, though controlled by the mouse, tends to keep its momentum a little longer than you wish it would.

In Crystal Crazy, however, there's more involved than just shooting. Sometimes you have to smash things against the walls, at other times you must wash your diamond over picture pieces until a complete image appears, and sometimes you actually have to move puzzle pieces to construct pictures. There's also new sorts of goodies to pick up, weirder ways to shoot things, bonus rounds—simply more of everything—while the unspeakably satisfying, finish-a-wave *aaahhhh* sound remains.

BEST BRAIN GAME

TROUBLED SOULS

Varcon Systems, 619/563-6700; $49.95.

OK, picture a marriage between Tetris and that fixture-fitting plumber game of a few years ago called Pipe Dream. The minister who marries them is Edgar Allen Poe. Now you have Troubled Souls, a truly bizarre yet addictively compelling game created by Randy Reddig, a 17-year-old programmer with a truly nasty streak. Troubled Souls requires you to create rings, or closed circuits, from puzzle parts that drop down a chute. Things get tricky when the falling pieces come attached to, um, body parts; then you have to match, say, the severed ear pieces with other severed ear pieces, and the engorged heart pieces with the same. All this, while ghoulish, throbbing music pulses in the background.

Though this sounds rather gruesome, the game is actually a lot more seductive than sadistic. The gothic elements are really just elaborate window dressing for a well-balanced—and terrifically challenging—game-playing experience.

BEST FLIGHT SIMULATOR

F/A-18 HORNET

Graphic Simulations, 214/386-7575; $79.95.

Every year someone comes up with an absolutely mind-blowing simulation of a hot fighter plane, and in the face of some stiff competition, this year's hot model is the F/A-18 Hornet. It's a combination of dizzying verisimilitude, relatively straightforward game control (though some complexity is inevitable), and graphics so vivid that it feels as if you're in the cockpit. You can even play it with your friends—four on a network, or head-to-head via modem.

You get what you expect when you're strapped in the plane—a frighteningly realistic view of the heads-up display and instrument panel of one of the most fearsome fighters that technology (or McDonnell-Douglas) has ever produced. Of course, you can alter the view, but experienced jockeys rely on radar—once they figure out how it works.

Take a few minutes to assess your avionics and weapon systems in the 256-page manual (filled with charts, diagrams, photos, and the kind of talk that gets Tom Clancy's blood a-boiling). Better yet, work your way through those training fights. You'll need them, because you'll be using live ammo when you get to the gist of this game—performing vital military missions in the Middle East. By that time, you'll want to be fairly experienced in tak-

F/A-18 Hornet Remember those palmy Gulf War days? Well, you too can pitch smart bombs. Your targets even include some of those classy-looking bunkers. In this run, though, our heads-up display tells us we're much too close for comfort.

Quest for Glory I This scene might be subtitled *Dances with Elves.* Typically, your alter ego has to do the right thing to survive (in this case a jig, but not in the circle). This role-playing game obviously draws on fairy tales—but it's far from Grimm.

ing off and landing on aircraft carriers, because your foes in this simulation are pretty deadly.

If you liked the videos of the Gulf War, you'll love F/A-18 Hornet.

BEST SPORTS GAME

POWERPOKER

Electronic Arts, 415/571-7171; $49.95.

Why is it that a lot of the great outdoor sports games from other platforms don't make it to the Mac? Can't figure it out. Meanwhile, there are plenty of indoor games to play, and for anyone who has sweated out aces and eights while wondering whether the cool character across the table is holding a trump card, here is the poker experience fully captured, complete with digitized sounds of card shuffling. Designer Todd Oustz has provided everything short of the pretzels and beer, including an array of variations on basic poker that might even stump some of your college buddies. Tennessee, Anaconda, Baseball, Football—they're all here. You can even make up your own.

PowerPoker The showdown: the human player, on top, playing an obscure variation of poker-style baseball (in which a total of eight cards are dealt) is obviously perturbed as his two pairs get beaten by a full house. In the current game, fours are wild.

You draw chips against five opponents rendered either in cartoony graphics or QuickTime videos (which are too slow). Almost everything, including the colors of the cards, the game rules, and the house stakes, is under your control—except, of course, the luck of the draw. Still, you are at an advantage here. PowerPoker provides you with the information you always want but can never remember when the chips are literally down. What are the odds of improving a hand? What's the chance that her ace-high is really a pair? All of this knowledge and much more is available to you—PowerPoker can even chart the relative success of your hands over the course of the evening.

PowerPoker has one fault, however: once you learn how some of your opponents play the game, you'll understand all too well how to read some of their rather artless bluffs. (And at times, a well-planned offensive on your part will scare off a superior hand.) But for a casual game of Draw or Hold 'em—or as a wonderful training ground for the real thing—PowerPoker is fine. Plus, it saves you the trouble of rounding up five easy marks. And if you do have friends on your network, you can use the game as a house dealer and a bank.

BEST ROLE-PLAYING GAME

QUEST FOR GLORY

Sierra On-Line, 206/649-9800; $29.95.

Have you ever noticed how *serious* role-playing games can be? All these tools of mayhem, the lists of sepulchral spells, and the grim accumulation of dead foes. So it's a genuine pleasure to welcome Quest for Glory I, which merges classic role-playing aspects—building up a character's attributes by vanquishing enemies, all in service of a larger goal—with the more playful mood and interactivity of Sierra On-Line's King's Quest adventure-game series.

The graphics here are every bit as vivid as the plot, and the atmosphere is more like a fairy tale than your typical dungeons-and-dragons deal. The idea is to be a hero—sort of a single-handed Seven Samurai—saving the town of Spielburg (bad pun) from oppression by thieving brigands. You decide whether you want to be a fighter, magician, or thief; check out some weird folks in town; and venture into the forest, where all sorts of hostile critters hang out. When you encounter someone or something itching for a fight (a rather pedestrian assortment of creepies and monsters await you), you go into combat mode. At that point Quest for Glory takes on an arcade aspect, but ultimately the determining factors in your character's survival are strength, health, and stamina.

What's nice about the game is that things never degenerate into the slaughterhouse mentality of some other role-playing games. You'll have some interesting interactions with people you meet, and you'll actually have to use your brain here and there. It's a kinder, gentler form of role-playing game, and one particularly well suited to newcomers to the genre, especially those familiar with adventure gaming. m

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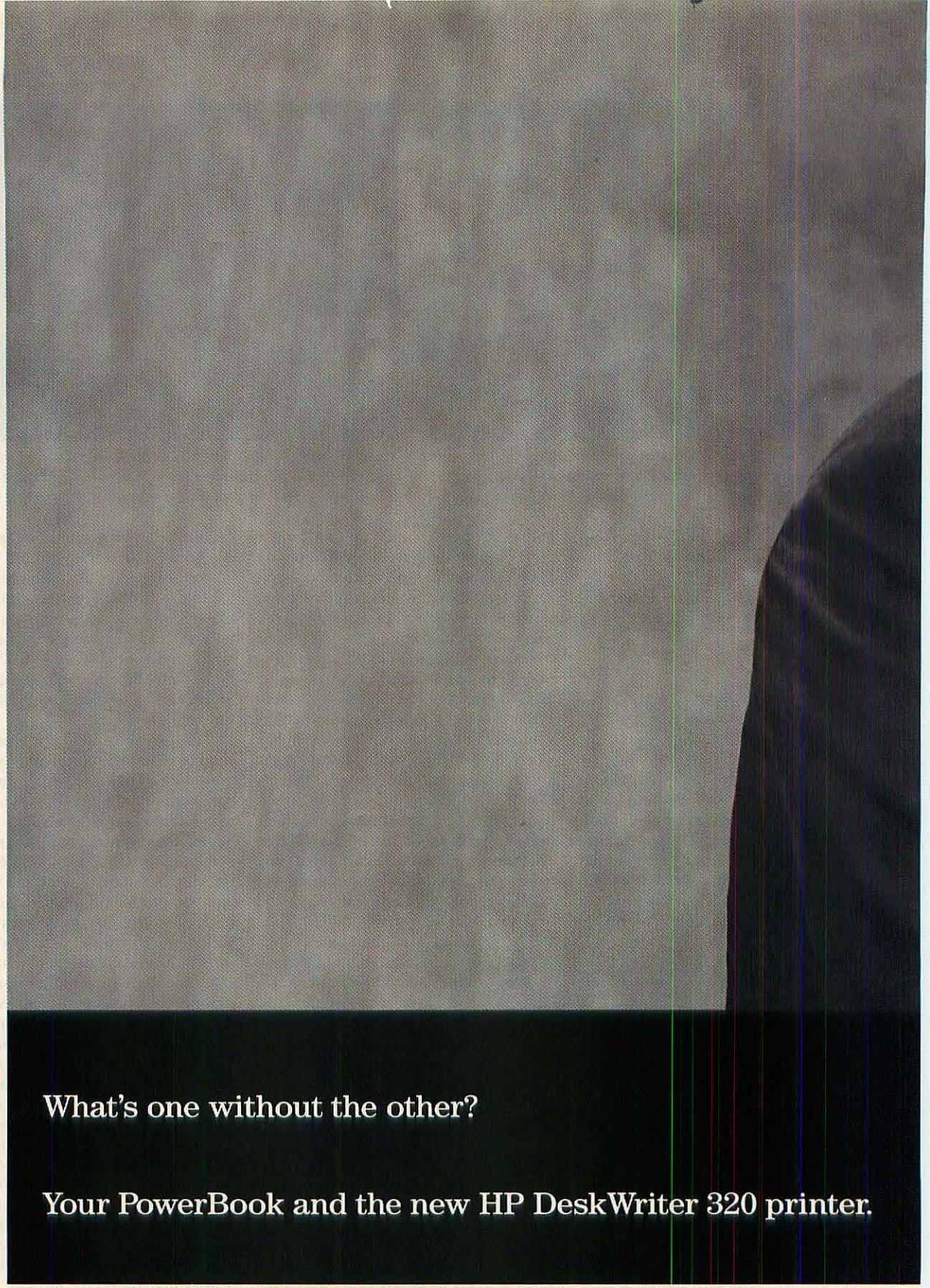
STEVEN LEVY's latest book is *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994).



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What's the Best Portable?

by Wendy Sharp

Back in October 1992, Apple introduced the PowerBook Duos as a comprehensive solution in portable computing. The minimalist Duos didn't have floppy drives, SCSI ports, or video output, but they weighed only 4 pounds. And because they let you add and remove features through the judicious use of docking stations, Duos were the most flexible Macintosh notebooks. A Duo could be either a lightweight Mac with which to travel or—when you plugged it into a docking station—a fully functional, fully connected Mac on your desk. Then in May 1994, Apple introduced the PowerBook 500 series. These all-in-one notebooks have Ethernet ports, internal hard drives as large as 1GB, PCMCIA card support, an innovative new input device, and much more. In fact, for the first time, it's possible to buy a PowerBook with all the features of a desktop Mac—or a dock-equipped Duo. Why, then, would anyone still choose a Duo?

The answer is the same as it was before the PowerBook 500's were introduced: Duos are a great choice for their flexibility and their light weight. But are they the right choice for you? Apple currently sells seven PowerBooks. These are the 150, 520, 520c, 540, 540c, and the Duos 280 and 280c. (If you're unfamiliar with Apple's nomenclature, the two things to remember are that *c* means color and that the higher the number, the more high-powered the CPU. The 540 and 280 will be discontinued by the end of 1994.)

If you're looking for a budget option and insist on a new computer, your only choice is the PowerBook 150, although you'll probably find it lacking and wish you had waited to save more money (see *Reviews*, *Macworld*, December 1994). If money isn't your first priority, either a PowerBook 500-series or a Duo makes more sense. Which one, though, depends on how you intend to use it.

The One and Only?

If you're trying to decide whether a PowerBook—any PowerBook—can be your sole computer, my answer is simple. No. At least, not without peripherals.

For sustained use, a keyboard and monitor whose bottoms are at the same height are bad news. Looking down at a screen for hours can give you backaches; raising a keyboard to just above eye level can damage your wrists and forearms (see "Safer Computing," *Macworld*, December 1994). Plus, neither the displays nor the input devices of PowerBooks or Duos are ideal for long-term work.

Although the display quality of the PowerBook 540's is slightly preferable to the display quality of the Duos, none of the screens are comfortable to look at for eight hours a day. The active matrix screens of the PowerBook 540's approach the quality of standard monitors, but the screens are small: 9.5 inches on the diagonal. This compares with 9 inches for the gray-scale Duo 280 and 8.4 inches for the color Duo 280c. (On most 14-inch monitors the portion of the screen that actually displays an image measures between 11 and 13 inches on the diagonal.)

The PowerBook 520-series' passive matrix screens are inappropriate for daily, full-time use—that's no surprise. But even the active matrix screens used in the Duos and PowerBook 540 series are inappropriate, despite being superior to passive matrix screens.

The input-device situation is just as problematic. A Duo's keyboard is 88 percent the size of a standard keyboard. Using it forces your hands into a slightly cramped position, with your arms squeezed against your sides. For a few hours a day that's fine, but if you try to use

How to choose between a Duo and a PowerBook

the Duo for full-time computer work, you're asking for trouble. The PowerBook 500's have full-size keyboards that are more comfortable.

However, neither the PowerBooks' trackpad nor the Duos' trackball would be my choice for full-time work. No mistake: the trackpad—a touch-sensitive, black square that uses capacitance to respond to the movements of your finger—is extremely cool. Although it's fun to use (I think fingerpainting in kindergarten was the last time I tried drawing directly with my fingers), my hand feels strained fairly quickly. Positioning my index finger and thumb for drawing and clicking means awkwardly tucking up my other fingers and arching my hand—an unnatural and uncomfortable position. The Duo's trackball is easier for me to use—it has two buttons (the trackpad has only one), so clicking is simpler. Still, it's quite small, and although I don't mind its size, I've heard strong complaints from others. Both of these input devices are perfectly acceptable for short-term use or occasional use, but not as your sole option.

The solution, of course, is adding peripherals: a normal keyboard, a mouse, and a full-size monitor attached to your PowerBook or Duo make it as comfortable as any desktop computer. But how easy is it to attach those peripherals?

The Desktop Portable

A PowerBook 500-series Mac comes with all the connectivity options you've ever dreamed of. All of the 500-series PowerBooks have ports for Ethernet, ADB, SCSI, sound input and output, and video output, supporting external monitors up to 16 inches in 256-color mode (8-bit color depth). All 500's also have two battery bays, one of which doubles as a PDS slot. This slot can hold a battery, a PDS card, or a PCMCIA Expansion Module from Apple ($199, 408/996-1010). This PCMCIA adapter holds two Type II PCMCIA cards (typically used for wireless modems and other connection peripherals) or one Type III card (typically used for hard drives).

A Duo, on the other hand, has only a printer/modem port, a telephone-line connector for an internal modem, and a docking connector. This might sound terrifyingly limited—but with the right dock, a Duo can do anything a PowerBook can do.

To use a PowerBook 500 as a desktop computer, all you need to do is plug in a keyboard, a mouse, the monitor (via a video adapter that comes with the PowerBook), and the monitor cable; then change the settings in the Monitors control panel and you're ready to go. If you need to use an external hard drive or CD-ROM player, add an HDI-30 SCSI cable; if networking, add an Ethernet transceiver and cable. Easy enough, right? You can accomplish the same thing with a Duo by using Apple's $969 PowerBook Duo Dock II. And since everything is connected—and stays connected—to the Duo Dock, all you have to do is slide the Duo into the dock.

KEVIN CANDLAND

Which is better, the PowerBook 540c (right) or the Duo 280c? For a surprising number of people, the answer may be the Duo.

Unfortunately, the Duo Dock II is not portable. At 16 pounds and about the size of a Quadra 650, a Duo Dock II is acceptable only if you need all your connectivity options in one place. If you need all the features of a desktop Mac at work plus connectivity options when you travel, a Duo plus a Duo Dock II won't serve your purpose. That doesn't mean you should forgo the Duo, but it does mean you should look at a different kind of dock (see the sidebar "Docking Options").

Once you've added peripherals, both the PowerBooks and the Duos are perfectly acceptable sole computers, although they don't compare with the best—or even superior midrange—desktop Mac systems. Their CPUs are 68LC040s, ranging from the 25MHz version for the 520's to the 33MHz version for the Duos and 540's. This CPU doesn't have an FPU (a math coprocessor), so while the 500-series machines are generally faster than older PowerBooks, this is not the case for math-intensive tasks, such as rendering. And Macworld Lab tests showed that even a Quadra 650 handily outraced all the PowerBooks and Duos (see *Reviews*, October 1994).

The Two-Mac Solution

Instead of adding peripherals, another solution is to have both a desktop machine and a portable. A Quadra 630, Apple's newest inexpensive desktop system, is substantially faster than any current PowerBook options (see *Reviews*, November 1994). And sharing information between a desktop and a portable is easy to do: you can connect a PowerBook to another Mac using Apple's $39 HDI-30 SCSI System Cable, while the easiest way to connect a Duo to another computer is to create a LocalTalk network using two PhoneNet connectors. Although LocalTalk is far from the fastest networking option, on a mini network of two computers it's fast enough.

If you choose a separate desktop Mac, a Duo—with its roles as a docked desktop Mac and a subnotebook—seems to lose its purpose. After all, if it won't be your desktop machine, why buy it?

On the Road

The obvious reason to buy any portable computer is mobility: even if you don't travel regularly, there are advantages to being able to work anywhere. But to accomplish that, you need a lightweight computer—one that you're comfortable carrying for extended periods, as well as a computer whose batteries are powerful enough to let you get some work done.

Both the Duos and the 500-series PowerBooks use high-capacity NiMH (nickel-metal-hydride) batteries (although they're different types). It's reasonable to expect about three hours of use per battery. The big difference is that the PowerBook 500's have two battery bays, and if you choose to use both for batteries, you'll get twice the battery life of a Duo. (The obvious caveat is that you can use two batteries with a Duo, too—just not at the same time.) Of course, this capability doesn't come free. The battery's price is only $139; its weight is the heavier cost.

An extra battery adds 0.8 pounds to a PowerBook's weight. A fully loaded PowerBook 540c—with two batteries and an internal PowerPort Mercury modem from Global Village Communication—weighs 7.35 lb. No problem, right? But add the AC adapter (an item you'll probably always want to carry with you) and a carrying case, and the weight goes up to a seriously unpleasant 10.35 lb. As far as I'm concerned, that's simply too heavy—with or without that extra battery.

The Duo 280c, with one battery and an internal modem, weighs 5.05 lb. When you add an AC adapter and a carrying case, that goes up to 7.75 lb. (The difference is that the Duo's AC adapter isn't as heavy as the PowerBook 540's: according to Apple, the PowerBook 500's require a larger power supply to support dual batteries.) Of course, every dock and cable adds weight. But if your needs are simple, the weight of a Duo stays well under that of a PowerBook 540c.

The average weight of docks varies greatly, but those that you would travel with (any but the Apple Duo Dock or Duo Dock II) range from 0.25 lb to 1.25 lb. The simpler your needs, the lighter the dock. If, for example, you want to use a color monitor, keyboard, and mouse while traveling—but you won't need to attach a SCSI device or connect to an Ethernet network—Newer Technology's Color MicroDock ($349, 316/685-4904) can fill the need for about 0.34 lb.

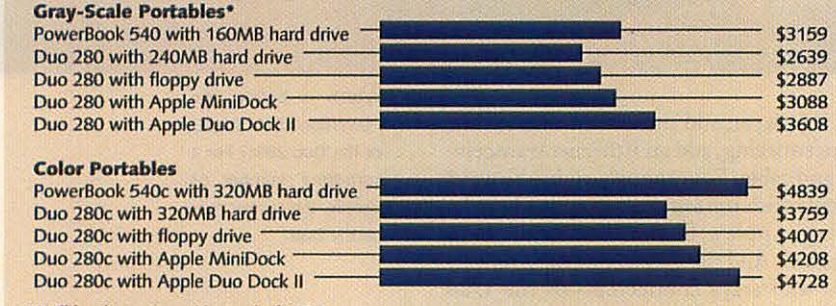
Even if your needs aren't simple, leaving a dock behind when you *don't* need it is a Duo's big advantage. If you're off on a business trip where you'll make a major presentation, you bring a dock: on the other hand, if it's a gorgeous day and you want to work in the park down the street, you can leave your dock at home. And although one of the common complaints about Duos is that remembering to take all the necessary external pieces with you is too much work, to some extent forgetting externals is the occupational hazard of any notebook owner. Don't forget: *all* of a PowerBook's great connectors are meaningless without the right cables.

Singular Options

The new PowerBooks do have two features that no dock currently provides for Duos: a PDS slot and a PCMCIA option. At the moment, these features shouldn't be critical elements in your buying decision. First, no PDS cards for the PowerBook 500 series are shipping. And I don't expect companies to offer PDS cards, for two reasons. First, many PowerBook 500-series owners will want to use the PDS slot for either a second battery or for Apple's PCMCIA Expansion Module for PCMCIA support. Second, Apple's future PowerBooks are likely to switch to the PCI (Peripheral Component Interconnect) bus, making PowerBook PDS cards quickly irrelevant.

What PowerBooks Really Cost

This chart shows prices for the PowerBook 540's and their equivalent Duos; the Duo 280's that include a floppy adapter and floppy drive; Apple's MiniDock; and Apple's Duo Dock II. Using the Duo Dock II requires an additional monitor and keyboard, but because achieving similar functionality with PowerBook 540's would also require a monitor and keyboard, the chart leaves out these costs (since they're the same). The prices listed are for minimum configurations for the systems: to add another 8MB of RAM and a modem, according to Apple, would cost an additional $520 for the 280, $540 for the 280c, $690 for the 540, and $700 for the 540c.



* Will be discontinued by end of 1994.

What about PCMCIA? The most common PCMCIA cards in the PC market are modem cards and network cards—both options that are already available for Duos without PCMCIA. Wireless networking cards will also be available for use with the PCMCIA adapter. For example, as we went to press, Dayna Communications planned to ship the DaynaComm Roamer PCMCIA Cordless Network Adapter ($699, 801/269-7200) in November. In October, though, Dayna shipped the DaynaComm Roamer Serial Roamer (also $699) for use with a Duo.

Other suggested uses of PCMCIA include added storage, or personalized storage on a corporate loan machine. Certainly the personalized storage sounds convenient—but at the moment, it's a lot more expensive than other options. For the same price as a PCMCIA adapter and ten 130MB hard drive cards (at about $500 each), you could buy a portable magneto-optical drive, ten 128MB cartridges—and a Duo 280c!

Although at first glance PCMCIA looks intriguing, for the time being the PCMCIA adapter doesn't give the PowerBook 500's a considerable advantage over the Duos.

Beyond the List Price

Price isn't an advantage for the PowerBook 500's, either, although it's difficult to compare prices between Duos and PowerBooks because of the numerous hidden costs. For example, a Duo 280 plus two PhoneNet connectors (about $15 each) is, at $2669, the least expensive, usable option; but it requires a second Mac—a cost ranging from about $400 for a used SE to about $2500 for a new Power Mac 6100 system. On the PowerBook side, video-out ports are useful only if you have a monitor to connect to, and Ethernet requires a transceiver, a cable, and a network.

Because the Duo 280's and the PowerBook 540's use the same 33MHz 68LC040 processor and active matrix screens, it makes the most sense to compare their prices. Duos are less expensive—until you start adding docks (see the chart, "What PowerBooks Really Cost"). If you have a clear idea of how you'll use your portable computer, a Duo is probably cheaper because you can pay for only the options you'll need. But if you think you'll need absolutely everything, a PowerBook 540 may be less expensive in the long run.

The Last Word

The PowerBook 500-series Macs are appealing computers, elegantly high-tech and feature-rich. But I would never buy one. They're not a satisfying replacement for a desktop computer, and as far as I'm concerned, they're too heavy to be a great portable. The Duos, on the other hand, are fantastic portables. They're light enough to go everywhere you go, and incredibly versatile with the addition of available docks.

Someday Apple will develop the perfect notebook computer—light as a spiral-bound paper notebook, compatible with any network, and connectible to anything from your car to your home-security system. Meanwhile, I'll stick with a Duo. **m**

WENDY SHARP, a *Macworld* associate reviews editor, is the happy owner of a Duo 230.

DOCKING OPTIONS

It's impossible to talk about Duos without talking about docks. Docks give Duos power and flexibility. Connecting a Duo to a dock adds features that range from the simplicity of a floppy drive to the complexity of NuBus cards and Ethernet.

There are three styles of docks. The smallest weigh about 5 ounces and include one main port, such as a floppy-drive port or an Ethernet connector, as well as an ADB port. Available small docks include the PowerBook Duo Floppy Adapter ($109, but the floppy drive is another $139); Asanté Technologies' NetDock ($259, 408/435-8388) with an Ethernet port; the Focus Enhancements SCSI Dock ($139.99, 617/938-8088); and Newer Technology's MicroDock series, which includes the Color MicroDock ($349), Ethernet MicroDock ($249), and SCSI MicroDock ($195). These tiny docks are great if you need to add only a single feature to a Duo.

KEVIN CANDLAND

A Dock Sampler Apple's Duo Dock II (top), Apple's PowerBook Duo MiniDock (bottom left), and Newer Technology's SCSI MicroDock.

The midrange docks include Apple's PowerBook Duo MiniDock ($449), Radius's EtherDock ($699, 408/541-6100) and Powerlink Presentor ($499), and RasterOps' DuoMate 8 ($299, 408/562-4200) and DuoMate 16sc ($649). (The Radius docks are the former E-Machines line that Radius inherited when it bought SuperMac Technology this fall.) Unlike the smaller docks, midrange docks come in all shapes and sizes. All offer an ADB port, a floppy drive port, sound output, and video output of varying levels. The MiniDock, the EtherDock, and the DuoMate 16sc also include SCSI ports, and both the MiniDock and the EtherDock offer sound input as well as output. Finally, the EtherDock includes an Ethernet connector.

The last dock, Apple's Duo Dock, is more or less one of a kind—more or less because Apple is now shipping both the second and third versions of the same product. (The original PowerBook Duo Dock was revised to fit the color Duos but the name wasn't changed.) The PowerBook Duo Dock ($519) and the PowerBook Duo Dock II ($969) are both variations on a theme—a desktop docking station that's just about as big as a Quadra 650 and that includes all the features of a desktop computer, such as a built-in floppy drive, optional hard drive, two NuBus slots, and all the standard ports (although only the Duo Dock II includes an Ethernet port). While the smaller docks connect to the back of a Duo, the desktop docks swallow it, like a tape in a VCR, so a monitor and keyboard are necessary extras.

When all else fails,

Starting at $119

There are three types of computer users: those who have lost data due to a power problem, those who are going to, and those who have protected themselves against the inevitable surge, blackout or brownout with the most reliable UPS they can buy: Back-UPS by APC. In fact, editors and users alike agree that if your system demands absolute reliability, you can depend on APC Back-UPS.

According to a study by Bell Labs, undervoltages represent the overwhelming majority of power problems likely to hit your computer. The question is not if a failure will occur, but when. Whether due to construction, wiring, weather, other office equipment, or accidents, power problems are as inevitable as death and taxes. That's why you need instantaneous battery backup power from the Back-UPS to prevent data loss, hard disk crashes, and hardware damage.

If you're concerned about lightning, rest assured that when measured using the ANSI/IEEE 587 Category A test wave, Back-UPS are superior to virtually all separate surge suppressors. Surge performance is even backed by a $25,000 Lifetime Equipment Protection Guarantee.

APC Voted most reliable by 3-to-1
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PC MAGAZINE

In a recent poll by PC Magazine's MagNet, APC was voted the most reliable UPS manufacturer by a 3-to-1 margin. That's dependability that will see you though years of unmatched power protection.

PC MAGAZINE UK EDITORS' CHOICE

"The clear winner in price performance...it's unbeatable..."

August 1993
APC Back UPS 1250

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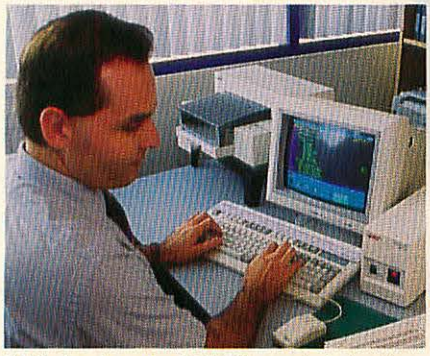
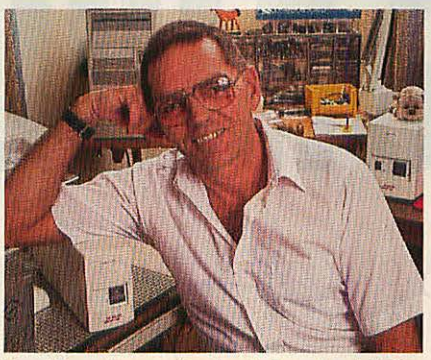
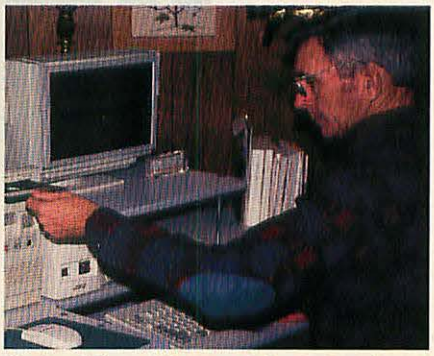


"All other brands of UPS die regularly in this lightning prone environment. My APC won't die!" said Paul Sisilli, Systems Analyst, City of Port St. Lucie . "With other brands, users don't find out until it is too late. The power interruptions here are very hard to live with. The other brands are dying off. Typically they last just beyond their warranty period. My Back-UPS is going on three years...no other brand is as reliable."



Don Truax knows first hand about Back-UPS reliability: "It ought to be against the law to buy a computer without an APC Back-UPS 250. I recently had a direct lightning hit right outside the house...my computer never blinked. Each morning I get a surge down the line and both APC's hate it - they simultaneously 'holler 'n clamp' while my 'Brand T' quietly sleeps in. I've relegated that unit to non-critical household stuff like my VCR."



Andrew Wargo, Manager at Baxter Land Company, tried two other brands before Back-UPS. "One lasted a few days, a second one went up in smoke after 48 hours, a third lasted less than 24 hours! I then bought my Back-UPS for less than half of what I had paid for the others. We've purchased three more Back-UPS and for the past 14 months they've been just hummin' away on the same power line that was eating the other brands alive!"

If you're protecting a network server, a communications interface port (on models Back-UPS 400 and higher) provides the security of an automatic shutdown to all major OS including NetWare, Windows, Windows NT, LAN Server, LAN Manager, LANtastic, SCO Unix, OS/2, Banyan Vines, AppleShare/System7 and more, so your data is safe whether the system is attended or not. (PowerChute software and interface kits sold separately.)

And since data processed on networked clients needs protection too, the $139 Back-UPS 280 provides an economical solution for all your LAN workstations. And if you have a new green PC, the price is even better at $119 for the new Back-UPS 200.

MADE IN

Discovering how essential Back-UPS protection is can be hard...if you wait for the next storm to roll through. But discovering how affordable it has become is easy...

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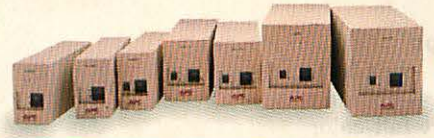

Back-UPS (L to R)	Application	Sugg. List
200	Green PCs, small desktop systems	$119
280	Desktop systems, LAN nodes, POS	$139
400	Desktop 486, 386 systems, servers	$229
450	Tower 486, 386 systems, servers	$279
600	Heavily configured systems, CAD/CAM workstations	$399
900	Multiple systems, longer runtime applications	$599
1250	Multiple systems, LAN hubs, small minis, telecom equipment	$799

More than... 2,000,000 Satisfied Users

APC has won more awards for performance and reliability than all other UPS vendors combined...including five consecutive LAN Times *Readers Choice awards...*

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LAN Interface *(on Back-UPS 400 and up) provides automatic shutdown to all major OS: Windows, NT, NetWare, LAN Server, LAN Manager, LANtastic, Unix, OS/2, Vines, AppleShare/System7 and more.*

Site diagnostics *automatically spot missing ground and reversed polarity, two common miswirings which usually require an electrician's visit to diagnose.*

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$25,000 *Lifetime Equipment Protection*

Hot Swappable, User Replaceable Batteries *reduce service time, costs by allowing safe removal and replacement of exhausted batteries, while your system stays running.*

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desktop trapping

How well does your graphics program keep colors in line?

by Deke McClelland

At long last, there are some encouraging indications that the days of manual trapping—the process of eliminating the gaps between neighboring areas of color—may be drawing to a close.

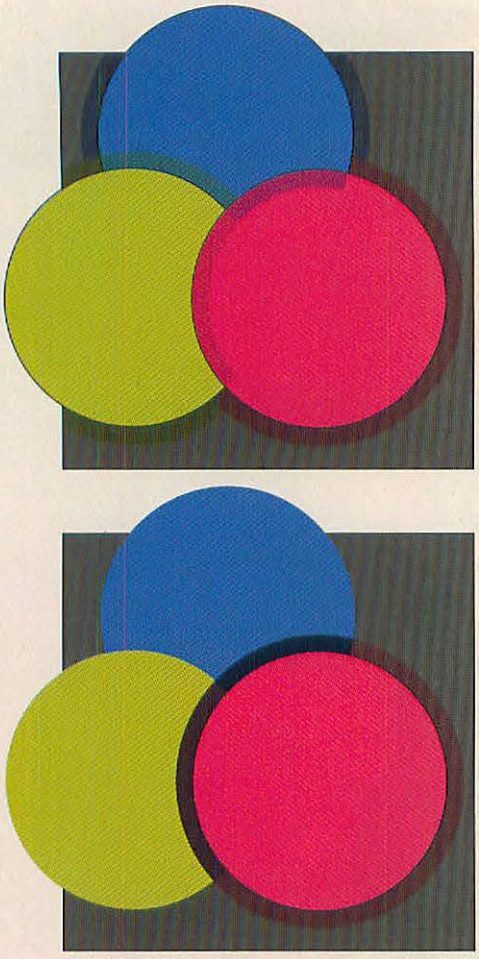
In the past, only a few programs such as Adobe Photoshop and QuarkXPress offered automated, albeit fairly rudimentary, trapping. (Aldus FreeHand 3.1's modest trapping functions were eliminated in version 4.0.) Recently, however, some programs have provided more-sophisticated trapping controls. Adobe Illustrator 5.5, for example, ships with a special filter that adds traps to selected paths in your illustration, and Adobe now offers an addition called TrapMaker that works with PageMaker 5.0.

Meanwhile, anyone with a generous software budget can now purchase a dedicated trapping package such as Island Graphics' IslandTrapper ($4495) or Aldus TrapWise ($4995). As you may guess from their high price tags, however, both programs assume you're well versed in trapping and electronic prepress. A third package, Scitex Full Auto Frame (from Scitex America Corporation, 617/275-5150), appeals to an even more rarefied clientele. At nearly $10,000, Full Auto Frame works exclusively with a $75,000 dedicated Scitex system, via a Scitex-based RIP on a Macintosh. For more on these trapping systems, see the sidebar "Trapping at the Top: A Guide to High-End Trapping Software."

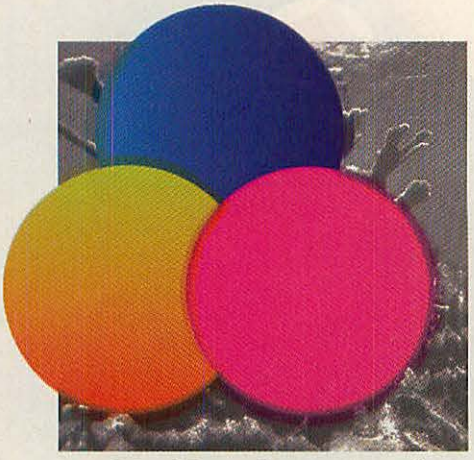
For this article, I tested the automatic trapping controls in the graphics programs you use every day—namely, Adobe Illustrator, Adobe Photoshop, QuarkXPress, and PageMaker—evaluating each program's ability to handle five typical situations that require trapping. For a description and visual examples of these situations, see the diagram "Five Common Process-Color Trapping Scenarios." To begin, though, I explain what trapping is, how it works, and perhaps most important, when you should—and should *not*—use trapping.

Trapping Zaps Color Gaps

In a perfect world, trapping—the Clearasil of the prepress industry—wouldn't be necessary. But alas, every full-color document, regardless of how much you pay to print it—has the potential for blemishes that need to be headed off at the press. That's because a successful print job depends not only on the equipment and the operator, but also on variables such as paper-stock quality, ink viscosity, even the relative humidity of the press area. Lots of minute errors can



Selective Traps These two examples show the effects of trapping in Illustrator 5.5. In each case, the shapes with the thin black outlines were selected; shapes without outlines were not. When all shapes are selected (top), Illustrator takes each shape into consideration when creating traps. But when only the pink and gray shapes are selected (bottom), Illustrator ignores the other shapes and generates traps as if the shapes weren't there. (I thickened the traps for better visiblility.)



Rasterize and Trap After rasterizing an Illustrator file in Photoshop, I was able to trap flat fills, gradations, and images with equal success in CMYK mode. I set the Trap command to its highest Width setting to make the traps as obvious as possible.

occur, not the least of which is press misregistration.

When printing full-color documents, your printer has to generate a separate plate for each process color, spot color, and varnish that goes into the mix. These plates must be exactly aligned on the printing press, or *registered.* But even if the press operator can align plates in his or her sleep (as most can and probably have), the plates may shift slightly, the paper may stretch, and the ink may bleed or even shrink. If a foreground object *knocks out* part of a background object, that area of the background object doesn't print. But because a knockout creates abrupt changes where the objects meet, slight gaps of uninked paper appear between the objects.

Trapping is the solution. By expanding neighboring areas of color so they overlap slightly, you create a buffer zone. If color A extends 0.5 points into color B, for example, the registration can be off by as much as 0.5 points—a fairly sizable shift—without any gaps occurring. Put more simply, traps zap gaps. Trapping won't cure massive registration problems—as exhibited in a typical page from the Sunday comics—but it will cover up the slight errors that have a habit of rankling the most obliging clients.

Traps often result in dark outlines where the colors overlap, though they're usually less noticeable than the white gaps that would occur without traps. But if two neighboring shapes are filled with light colors—say, one with 60 percent yellow and the other with 30 percent cyan—the darker trap, a pale green comprising both colors, may in fact be more noticeable than a white gap. To avoid this, many programs—including Illustrator and TrapMaker—let you reduce the amount of ink coverage to create a trap that's no darker than either of the neighboring colors. You might drop the trap down to two-thirds of its original density—40 percent yellow and 20 percent cyan—thereby making the trap almost imperceptible.

To create a trap, an application typically expands the edge of one object and prints it on top of the edge of the neighboring object. This technique is also referred to as either *choking* or *spreading.* Quite simply, choking means the edge of the background expands and overprints the edge of the foreground object; spreading is when the foreground edge expands and overprints the background edge.

When Not to Trap

Trapping is needed only if your pages contain high-contrast edges that will be printed using substantially different inks. In other cases, trapping is not only a waste of time, but can actually hurt your document. For example, details inside continuous-tone images, including scanned photographs and most other pixel-based artwork, don't need to be trapped because there is extremely little difference between the color of one pixel and the colors of each of its neighbors. If you were to graph the value of each neighboring pixel, your graph would look like a series of rolling hills. Trapping would be necessary only if the graph showed absolutely straight up-and-down cliffs. Trapping can hurt images because it softens transitions and muddies important details.

Likewise, adjacent continuous-tone images—inside a desktop publishing package such as PageMaker or Quark—almost never require trapping. Even if one image's edge is green and its neighbor's is red, the two edges likely share process colors (here, a lot of yellow and perhaps a little magenta or black). So long as one process color remains in force from one image to the next, as it almost always does, any gap between the other inks will be covered by that color.

The same goes for neighboring hard-edged objects (including characters of text) that share process colors. As a rule of thumb, if two neighboring objects share one process color that varies by 50 percent or less (for example, 80 percent magenta with 25 percent cyan next to 30 percent magenta with 60 percent yellow) or if the objects share two or more process colors that vary by less than 80 percent, you don't need to trap. The continuous ink or inks will cover the gaps.

In most cases, *overprinting* (printing the color from one plate over the color from another plate) also eliminates the need for trapping. If a 100 percent magenta object overprints onto a 100 percent yellow background, resulting in a bright red area where the two overlap, there is no need for trapping, even though the two objects have no colors in common. Overprinting is especially popular when the foreground object contains 100 percent black because black appears richer when background colors are mixed in.

In fact, some layout artists manage to avoid trapping entirely by designing their documents so that it isn't necessary. Objects that don't overlap, images without borders, overprinting text, and shared process colors are the ingredients for a foolproof print job. But while this may seem like a lot of options, this solution offers little room to wiggle—too little to suit most designers.

Adobe Illustrator 5.5

Illustrator 5.5 ($595; Adobe Systems, 415/961-4100) offers trapping controls

Some folks think trapping should be left to trained professionals equipped with obscenely expensive prepress systems. In theory this is nonsense, on a par with earlier but similarly snobbish assessments regarding page design, typography, and photo retouching. In practice, however, no matter how deftly you manipulate the trapping controls in Adobe Illustrator or PageMaker, professional solutions provide much better results.

Full Auto Frame

Take, for example, Full Auto Frame—a trapping program that's part of Scitex's $75,000 PC-based Dolev prepress system. (For an additional $9900, you can get a Mac version of Full Auto Frame.) The hardware RIP included with the Dolev system rasterizes a PostScript file out to two files: a high-resolution (say, 2400-dpi) linework file, which contains all the object-oriented art and text in the document; and a lower resolution (300-dpi) continuous-tone image file, which contains all the bitmapped images and all gradations (whether originally created as objects or not). Full Auto Frame (*frame* is Scitex's term for a trap) traps the linework file, composites it with the image file, and sends the finished product to the Dolev imagesetter.

Although it's arguably the most capable electronic trapping system around, expect to pay extra for Scitex trapping services.

Trapwise versus IslandTrapper

Two professional trapping programs that aren't dependent on expensive hardware are TrapWise 2.1 (Adobe Systems, 415/961-4100) and IslandTrapper 1.1 (Island Graphics Corporation, 415/491-1000). The $4995 TrapWise rasterizes PostScript files in much the same way as Full Auto Frame. While the Scitex program applies traps to the rasterized file, TrapWise simply uses the file as a reference and writes traps to a separate PostScript document, or appends the traps to the original PostScript file. You can even generate color separations directly from TrapWise.

By contrast, the $4495 IslandTrapper renders EPS files to a proprietary vector format. After assigning traps, the program generates a new EPS document that you have to place into a page-layout program, such as PageMaker or QuarkXPress, to create color separations. (The upcoming IslandTrapper 2.0 will offer a built-in color-separation function.)

On a 680X0 Mac, both TrapWise and IslandTrapper take roughly three or four times as long as Full Auto Frame to render PostScript files. That's no surprise, since Full Auto Frame has access to a hardware RIP. But TrapWise and IslandTrapper also take anywhere from four to ten times as long to assign traps. TrapWise 2.1 functions two to three times as quickly on a Power Mac. (Though not available at press time, IslandTrapper 2.0 will also be accelerated for the Power Mac.) Both programs offer batch-processing features.

In general, I prefer TrapWise over IslandTrapper. Though the latter offers a more straightforward interface and even lets you edit the color of objects in your document, TrapWise has the more sophisticated capabilities. It can open multipage PageMaker files; IslandTrapper can open only one EPS page at a time, regardless of the originating application. TrapWise offers sliding traps that traverse from the inside of an object to the outside (or vice versa) to compensate for a gradation, essentially serving as both a choke and a spread at once. It lets you change the flatness of a trap—which reduces the trap to a series of straight lines—for quicker output. It can also trap imported TIFF and EPS images. And, for now, it has the added advantage of being able to open PostScript files without EPS previews and print them directly.

that aren't particularly powerful, but they are by far the best option available to a drawing program. Illustrator's Trap filter affects only those paths that are selected in an illustration, which lets you trap just the specific paths that need trapping. But Illustrator relies heavily on the expertise of the imperfect human user. For example, the Trap filter treats a deselected path that resides between two selected paths as if it doesn't even exist. The result is an incongruent trap that may look totally out of place with your illustration (see "Selective Traps").

Illustrator's Trap filter can't accommodate three of my five trapping scenarios, but it manages to offer satisfactory but limited workarounds for two of these.

1. Object against object. Illustrator traps one selected object against another just fine. You can reduce ink coverage to prevent overly dark traps and convert spot-color traps to their process-color equivalents. It's even smart enough not to create traps when the colors are too similar to warrant a trap.

2. Partial overlaps. Illustrator simply creates a trap around the edge where each pair of selected objects meets and ignores edges that don't touch.

3. Objects against gradient. Sadly, the Trap filter can't accommodate paths filled with gradations. However, if the foreground path is filled with a spot color, you can assign a stroke to the path and set the stroke to overprint. Just make the stroke twice the width that you would have made the trap, because the stroke is centered on the path. A 0.2-point trap, for example, warrants a 0.4-point stroke. (This technique doesn't work for process colors.)

4. Object against image. You can't trap imported images, either. Again, you can overprint spot-color strokes, but you're otherwise out of luck.

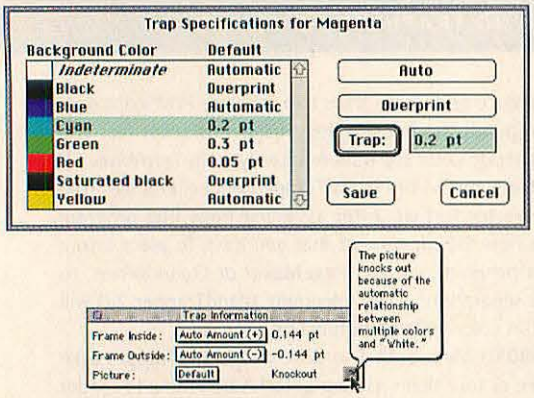
5. Keep-aways. You can easily create a keep-away by applying a plain black stroke to a saturated black shape. Since the black stroke extends beyond the boundary of the shape, it serves as a natural trap.

Another of Illustrator's limitations is that it traps fills only, not strokes. If you want to trap a stroke, you have to first convert it to a fill (using the Outline Path filter) and then apply the Trap filter.

Adobe Photoshop 2.5 and 3.0

Some state-of-the-art prepress systems trap documents by first rasterizing them to pixels, then modifying the pixels. Together, Photoshop ($895; Adobe Systems, 415/961-4100) and Illustrator constitute a more rudimentary but nonetheless functional trapping system.

When you open an Illustrator document in Photoshop, the latter converts the illustration into an image according to your size and resolution specifications. Once Photoshop has rasterized the image, you can apply the program's trapping function to the image as a whole. The operation is fully automated, offering only a single option for specifying the maximum width of the trap. And yet this function handles nearly all trapping scenarios, even going so far as to incremen-



Overriding Defaults QuarkXPress provides both global and selective trapping functions. You can override your global settings for a specific color (top) or a single object (bottom). When setting traps for colors, you can change the width of the trap and whether or not it overprints, but that's all. When selecting a single object, however, you have the additional option of requesting a spread, a choke, or a straight knockout (no trap).

tally reduce the width of the trap as the colors of neighboring areas grow more similar (see "Rasterize and Trap").

1. Object against object. 2. Partial overlaps. 3. Object against gradient. 4. Object against image. Since Photoshop rasterizes all objects to pixels, it traps objects, partial overlaps, gradients, and images uniformly and with equal success.

5. Keep-aways. The only trapping scenario that Photoshop doesn't handle is keep-aways with saturated blacks. Photoshop automatically converts black areas in an RGB or gray-scale image to saturated CMYK blacks, but the Trap command doesn't generate keep-aways.

QuarkXPress 3.3

Although the trapping options supplied by page-layout programs are generally more capable than those in Illustrator and Photoshop, they are also less satisfying because you do not get any direct screen feedback. In fact, you cannot see any results until you print the file, and then you have to hold the proofing pages up to the light to accurately gauge how the traps fit.

Otherwise, you get flexible and functional trapping in QuarkXPress (Quark, 303/344-3491). You can specify the default settings for every object in your document and leave it at that. Or, if the defaults don't suit every occasion, you can override your specifications for a single color. If that's still not enough, you can select an object and change the settings inside the Trap Information floating palette (see "Overriding Defaults"). And unlike Illustrator, QuarkXPress is capable of trapping strokes (which it calls frames) independently of fills. Quark even provides special compensation for text, applying trapping only when the form of the characters will not be adversely affected.

1. Object against object. QuarkXPress can trap objects against objects, but it cannot blend the colors in objects, as Illustrator and Photoshop can, nor can it reduce ink coverage to prevent dark traps. Rather, it simply overprints the existing colors in an object. It's not the best solution—especially for process-color traps—but it's frequently acceptable.

2. Partial overlaps. Quark can't vary the thickness of a trap as it surrounds the perimeter of an object. If an object appears in front of more than one object, and if one background object calls for a choke and the other a spread, Quark instead applies a single trap (according to its Indeterminate value) to the forwardmost object. Again, it's not the ideal solution, but it usually works.

3. Object against gradient. As long as a gradient and a solid object are on different separations, QuarkXPress spreads the object to trap the gradient. But because Quark can't mix colors, it can't trap two neighboring gradients.

4. Object against image. Quark can spread spot-color objects onto full-color images or process-color objects onto single-color images. But it can't mix process traps with the pixels in a full-color image.

5. Keep-aways. If a saturated black object is positioned in front of another object, QuarkXPress automatically creates a keep-away, choking the other colors without changing the black. Otherwise, you have to specify a trap in the Trap Information palette.

PageMaker 5.0 and TrapMaker 1.0

Nine years after its introduction, PageMaker ($589; Adobe Systems, 415/961-4100) finally supplies trapping capabilities in the form of its TrapMaker Addition ($79.95). I can't say that TrapMaker was worth the wait, but it wins my vote as the most robust trapper available to a desktop publishing program. (Adobe plans to integrate automatic-trapping features in future versions of PageMaker.)

TrapMaker is good at determining where to position a trap. To accomplish this, TrapMaker evaluates colors according to their *neutral densities*—how light or dark each color is when all its primary colors are taken into consideration. If two objects have relatively similar densities, TrapMaker centers the trap on the edge of the two objects, rather than drawing it on one side of the object or the other.

TrapMaker's other controls enable you to specify a type size below which text trapping is prohibited (to ensure legible text) and customize trapping settings for certain color combinations. However, you cannot adjust settings for selected objects as you cannot in both Illustrator and QuarkXPress.

1. Object against object. In this department, TrapMaker, like QuarkXPress, doesn't mix values on a single separation. However, TrapMaker can mix values differently from one separation to the next, effectively creating independently colored traps, and it can avoid overly dark traps by applying the lighter of two values in a single separation.

2. Partial overlaps. While QuarkXPress spreads or chokes uniformly when partial overlaps are involved, TrapMaker draws a different trap for every pair of intersecting objects and never draws a trap over blank paper.

3. Object against gradient. Since PageMaker is one of the few programs that can't create gradations, it's little surprise TrapMaker can't trap them.

4. Object against image. TrapMaker ignores imported images entirely, creating knockouts without traps, even if an image resides on a single separation.

5. Keep-aways. TrapMaker automates the printing of keep-aways, but only if the object filled with saturated black overlaps another object (similar to QuarkXPress). If not, you have to slide a dummy object behind the saturated black object to force a trap.

Because TrapMaker is an Addition, its options aren't integrated into other portions of PageMaker. To use the Addition, you choose the TrapMaker command, set options inside a dialog box, and print directly from there. It is also worth noting that TrapMaker has online documentation only. You get a poster that shows off TrapMaker's capabilities, but no printed manual. Even so, the features are sturdy enough to satisfy most desktop publishers.

The Last Word

None of these programs are able to handle all your trapping requirements—they all failed at least one of the five trapping scenarios. Just the same, consumer-level desktop trapping is getting better all the time, and it may one day meet the needs of the most discriminating designers.

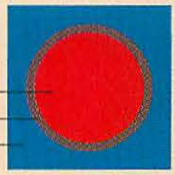
In the meantime, the question is, When should you attempt trapping on your own and when should you leave it to the experts? The answer depends on your finances. All but the most exclusive service bureaus charge higher (sometimes 50 percent more) per-page prices to trap

Five Common Process-Color Trapping Scenarios

Below are examples of trapping when printing with process colors. Here, as in all process-color trapping scenarios, a trap is unnecessary if adjacent colors are made of similar percentages of the same inks. Trapping with spot colors may differ somewhat.

1) OBJECT AGAINST OBJECT

C	M	Y	K
—	100%	100%	—
50%	50%	50%	10%
100%	—	—	20%

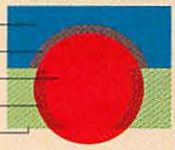


Plates viewed separately

When one object appears in front of or next to another, and the objects have no process colors in common, you need a trap to prevent any gaps from occurring when the file is printed. The trap is an area at the point where two differently colored objects come in contact with each other; it's made of inks used in both.

2) PARTIAL OVERLAPS

100%	—	—	20%
50%	50%	50%	10%
—	100%	100%	—
20%	100%	100%	—
30%	—	45%	—

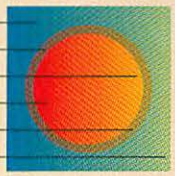


Plates viewed separately

When an object overlaps several other objects and partially extends into the wide-open spaces of exposed paper, the software must surround the forward object with many different traps, one for each pair of abutting colors, without trapping along the edges that border white space.

3) OBJECT AGAINST GRADIENT

100%	—	—	20%
50%	50%	50%	10%
—	20%	100%	—
—	100%	100%	—
30%	20%	80%	—
30%	—	45%	—



Plates viewed separately

In an object-oriented program, a gradation (sometimes called a *vignette* in trapping circles) is actually a series of incrementally colored objects enclosed in a mask. If an object partially covers a gradation, the software has to trap the object against every one of the masked colors. Things get even more complicated when one gradation overlaps another, as is commonly the case in high-end illustrations.

4) OBJECT AGAINST IMAGE

Various percentages			
Various percentages			
100%	—	—	20%

Plates viewed separately

Ideally, to trap an object against a bitmapped background, the software should calculate traps between the object and every pixel in the bitmapped image adjacent to the object's border. A less sophisticated alternative is to spread and overprint the edges of the object against the bitmap. The result won't look as good because the object may trap where it doesn't need to (for example, against a white background).

5) KEEP-AWAYS

70%	70%	70%	100%
—	—	—	100%

Plates viewed separately

A saturated black (100 percent black mixed with smaller percentages of cyan, magenta, and yellow) won't appear darker when overprinting objects with other process-color mixes; it also creates a true midnight black not possible using black ink alone. But the brighter inks can creep beyond the edges of a saturated-black object. To avoid getting a tiny fringe of colors, you need a *keep-away*: a hairline border of unsaturated black that's too thin to distinguish from the saturated black. Should the colors misregister a bit, they just print on the unsaturated black.

documents as they print them; the truly high-end printers include trapping in the per-page price whether you like it or not. If you're willing to pay the price, prepress professionals have access to superior equipment and software and will invariably come up with better results. But if you're publishing on a budget, consumer trapping options—particularly those available to Illustrator and PageMaker—are good enough to eliminate the most obvious gaps in your document.

Without a doubt, the most important thing to remember when trapping your own documents is to consult with your commercial printer. Only your printer knows the accuracy of the offset press that your document will be printed on. Most modern presses have small tolerances, typically in the neighborhood of 0.2 point (or about 0.1 millimeter), which is why 0.2 point is the default width offered by most trapping software.

And keep in mind that there's always the option to create a document that doesn't need to be trapped: overprint text whenever possible, make sure overlapping objects contain at least one shared process color, and assign either no borders or overprinting black borders to your imported images. You'll never have to worry about trapping again. **m**

DEKE McCLELLAND is the author of several books about high-end graphics programs, including *Macworld FreeHand 4 Bible, Macworld Photoshop Bible,* second edition (both 1994 releases from IDG Books Worldwide), and *The Illustrator 5.0/5.5 Book* (Peachpit Press, 1994).

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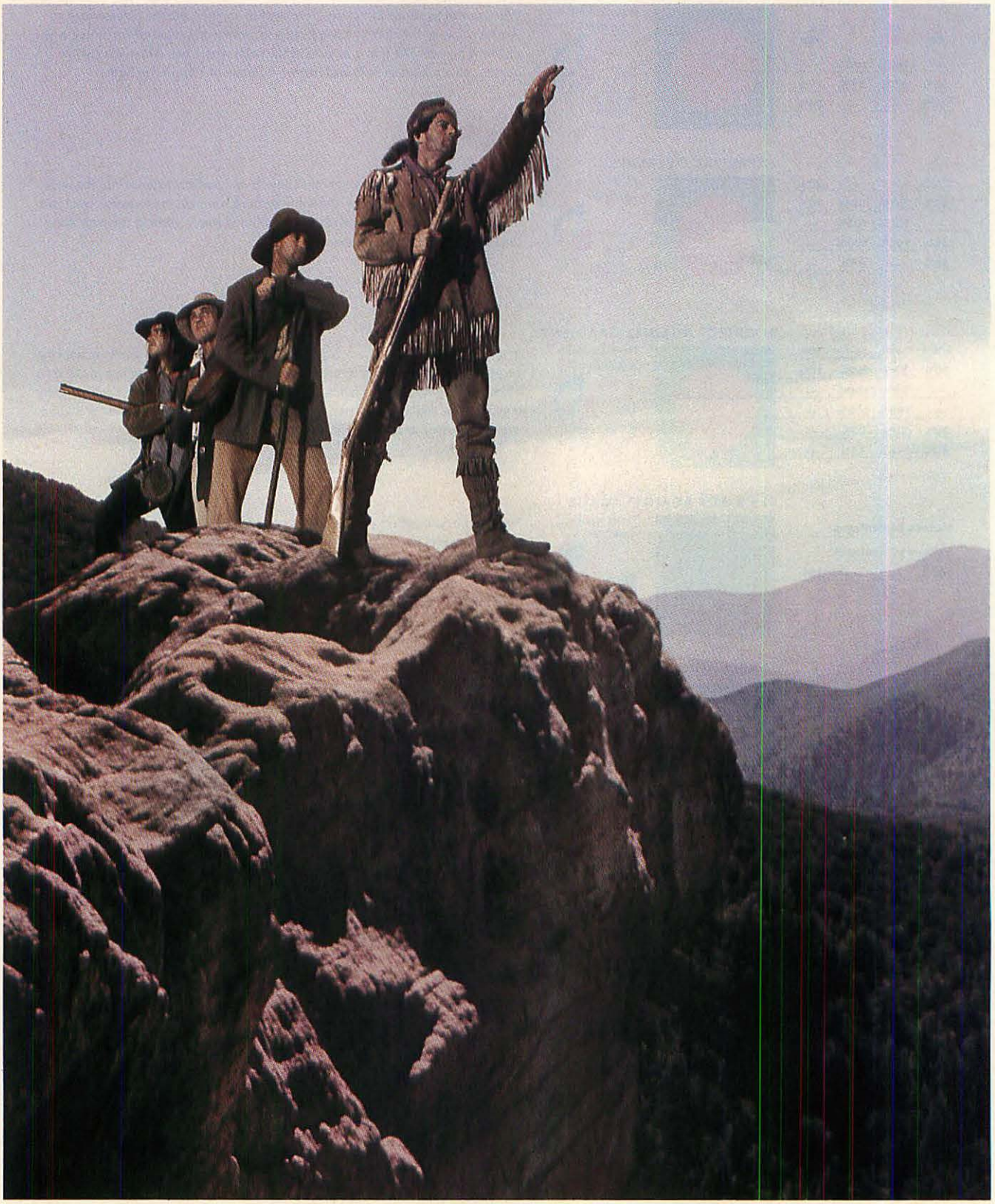
THAT'S WHY WE BUILT ONE IN



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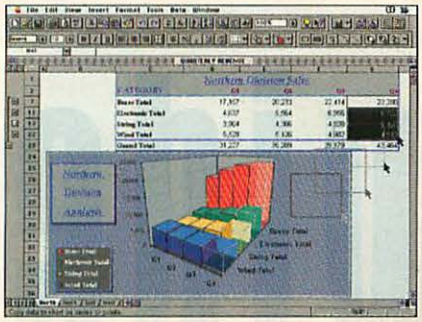

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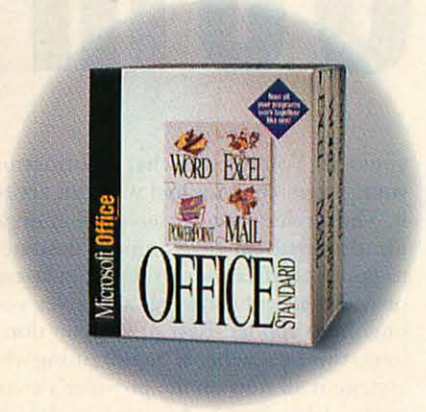

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by Martha Strizich

Is your organization growing and spreading out? Do you have sales reps promoting your company's product in several major markets? Does your association's membership hail from every corner of the nation? Or do you have customers with emergency tech-support questions that can't wait until 8:30 Monday morning?

If your answer to one of these questions is yes, a unified system for E-mail and other electronic communication—a full-fledged online information service—would be a big help. But chances are you don't have the budget for the servers and communication lines it would require to run your own system, nor the in-house expertise to build and administer it.

Private online information services, available today from a handful of providers, let you establish an exclusive electronic community where you can exchange information and communicate online with a group of users you choose yourself. You decide what information your system contains and who can access it. The service provider sets up your organization with an environment designed to your specifications, trains your users, provides access software, and gives you ongoing support. Best of all, you don't have the headache of maintaining the system: it all runs on the provider's computers, not yours, and you simply log on with a modem and a local telephone phone call when you need to.

Such a service can satisfy many communications needs. For example, a sales team could use it to keep its members current on pricing, policies, and products, or to hold electronic meetings. A trade association or professional organization could provide a forum where members could debate issues, learn about relevant legislation, and post job listings. Or a service and support contract could include round-the-clock access to an online database of technical information. You can even arrange for your service provider to bill your customers directly for their use of your system, or to send you the information you need to bill them yourself.

What Private Services Offer

Private online-system suppliers provide different services, but the basics include E-mail, electronic bulletin boards, and searchable databases. Another basic feature is support for adding your own logo to the interface, modifying icons, and changing menus to give the system your organization's look.

Other features that some services provide can improve communication as well. Real-time conferencing—where the message one user types appears immediately on the screens of other conference participants—lets users hold online meetings. Forms software lets you replicate your company's paper forms, such as expense reports and invoices, with electronic versions that your employees, customers, or others can fill out and deliver online. And text-searching lets users quickly pinpoint the information they are looking for in your databases and bulletin boards.

In picking a private online-information service provider, price is one of the most important considerations, of course, and vendors' pricing structures are complex, so consider them carefully. Start-up costs could range from as little as several thousand dollars to many tens of thousands, depending on how much custom programming you need, how many users will access it, and the size and complexity of the databases you put online. After you get the system running, expect to pay $3 to $30 or more per user per month, depending on how many users you have, how much time they spend online, or some combination of the two.

CompuServe, Connect, and GE Information Services offer private online-information services. Prodigy says it will offer such a service by the end of 1994 but was not able to provide details in time for this article.

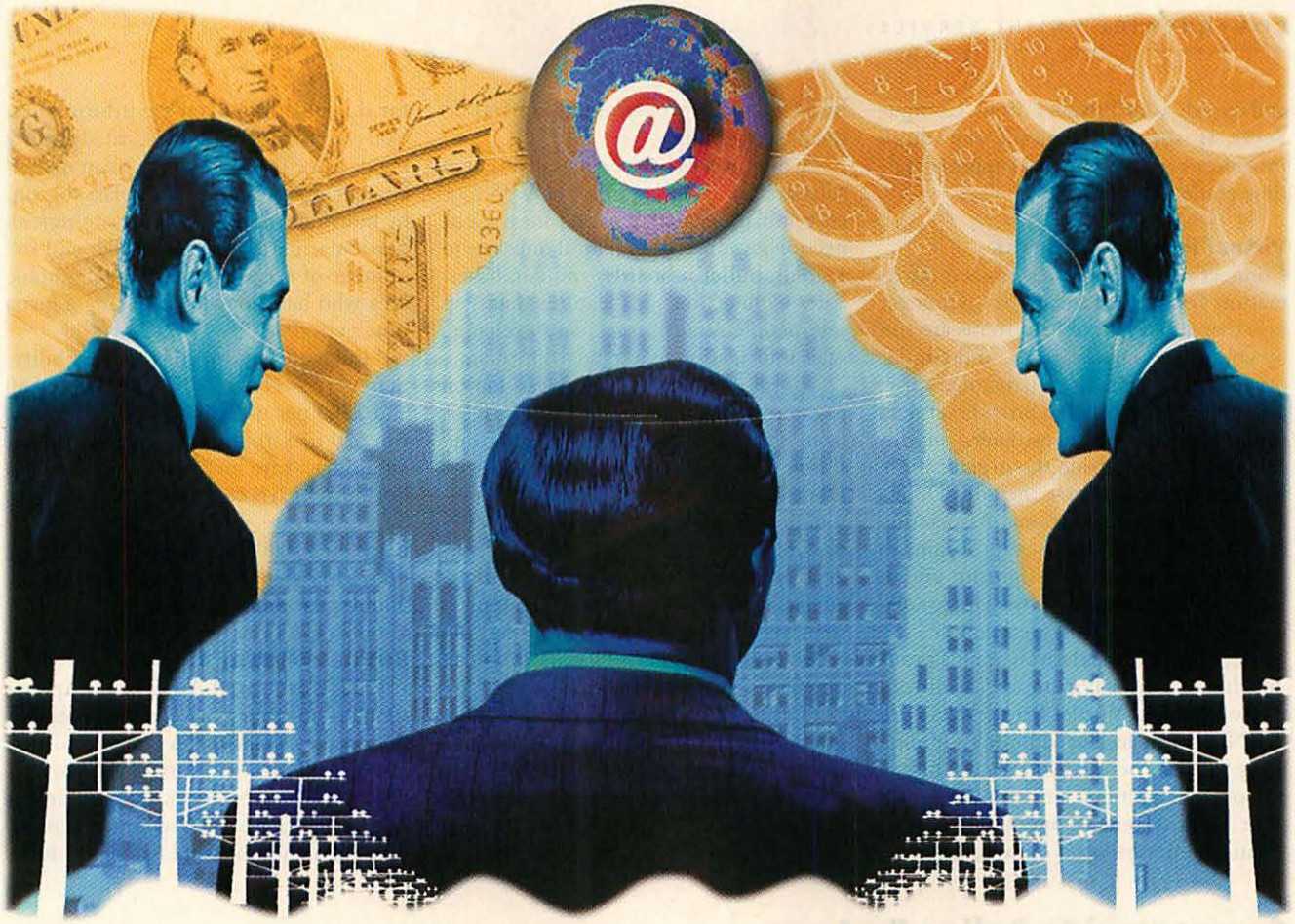
Combine E-mail,

Companywide

Private Forum

Though it is well known for running the largest public commercial online-information service, CompuServe also operates private online services, called Private Forums, through its Business Services Group. CompuServe says it operates more than 2000 Private Forum systems for clients running the gamut from retail stores to trade associations to direct-sales organizations such as Amway.

To access your Private Forum, users will need CompuServe Information Manager (CIM), the same communications software that CompuServe provides for subscribers to the public service ($10 in Macintosh, Windows, or DOS formats).



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remote conferencing, and file transfer in a single system

Online Services

CompuServe will customize the software, if you wish, with your company's logo and a special menu that welcomes users to your Private Forum, but that's as far as its customization capabilities go. To anyone familiar with CompuServe, your private system will resemble the public one.

Up front, you pay CompuServe a flat fee of $7500 to design and develop a simple Private Forum with several bulletin board areas and a few read-only databases, such as a calendar of events. Along with the setup, you get training for your system operator and documentation. But be prepared to pay at least $2500 more for a system that supports several large, searchable databases, such as product catalogs or price lists.

Online usage is free for the first three months. After that you're charged one of two ways. Smaller customers are usually billed $4.80 to $9.60 an hour for online usage or $5000 per month, whichever is more. Larger customers can negotiate a monthly fee that amounts to between $3 and $20 per user, based on the number of users and an estimate of online usage.

Setting up a Private Forum takes about eight weeks. Once it's up, your users can employ CompuServe's E-mail to send mail to users on other E-mail systems, including the Internet. They can also explore all public areas on CompuServe—in fact, there is no way to prevent your customers, staff, or others from downloading information from expensive databases or hanging out in chat rooms on your meter, but billing statements itemize how much time each user spends inside

and outside your Private Forum. CompuServe is the only one of the three providers covered here that supports real-time conferencing.

Virtual Private Networks

Connect's specialty is customized information systems for businesses. Connect says that about half of its systems are run by companies, associations, and similar organizations for their own members' use; the other half are used to provide services to (and interact with) customers, suppliers, and others outside the organization. Connect's installed base includes Domino's Pizza; the International Association of Fire Chiefs, which uses its system to share a database of fire-fighting know-how; and Software AG, a very large software company based in Germany.

Connect sells a relatively vanilla product that it calls a Forum, a customized version called a Virtual Private Network (VPN), and an engine with programming tools that can be used to create a highly customized system. You can program your own system to meet the special requirements of your organization, or hire Connect's programming staff to do the programming.

Connect sells two versions of its client software for accessing Forums, VPNs, or custom Connect systems. Business Connection gives users a graphical interface to E-mail, bulletin boards, and databases; Sales Connection adds features that help salespeople record, track, and exchange sales information in a standard format.

From within a VPN, you can log on to external data sources such as news feeds from The Associated Press, Reuters, and Business Wire; get stock reports; and send E-mail over the Internet. With a little custom programming, you can set up a VPN to connect to your own databases; Connect's servers act as a gateway to a dedicated line into your organization's computers so that customers, suppliers, and others can access your marketing information, upload purchase orders, and so on.

Other custom features available include an automatic log-on that runs searches unattended; a flash-message capability that calls users' attention to new information; and an electronic-commerce feature that lets you charge users for downloading database information. You can also order a sophisticated reporting package that tracks time spent online, characters downloaded, and last log-on, by individual user; the number of times a particular database is accessed; and the number of users in a certain geographic area who have logged on during a given time period.

But you pay for all this flexibility. Start-up costs for a VPN run between $80 and $200 per user; and monthly charges run $20 to $30 per user, based on either an hourly rate or a per-user rate. A Forum, which is comparable to a CompuServe Private Forum, will cost you between $7000 and $10,000 to start up, plus $150 per user for client software. Time spent online costs $11 per hour.

Business Network

If you've ever used AppleLink, Apple's soon-to-be-retired private online service, then you've already seen GE Information Services' Business Network in action. Other Business Network systems include Microsoft's Partner Network, for resellers and integrators, and Knight-Ridder's

Companywide Online Systems

	Virtual Private Network [A]	Business Network [B]	Private Forum
General			
Service provider	Connect	GE Information Services	CompuServe Business Services Group
Phone	408/973-0110, 800/262-2638	301/340-4950, 800/433-3683	614/457-8600, 800/525-0095
Features			
E-mail	yes	yes	yes
Real-time discussions	no	no	yes
Threaded discussions	yes	yes	yes
Searching	full-text, Boolean, multiple-database	full-text, Boolean	file name, author, sysop-designated keywords
Internet access	E-mail only	E-mail only	E-mail only
Customize interface	extensively	extensively	limited
Add functionality	very extensible	very extensible	limited
Forms	yes	yes	yes
Pricing			
Start-up fee	$80–$200 per user	none	$7500
Custom interface	negotiable	approximately $2000	$2500
Add functionality	negotiable	negotiable	no
Client software	Business Connection $150; Sales Connection $695	$100–$249 [C]	$10
Special software	none	PerForm Pro Filler $39–$79 [D]	none
Online charge	$11 per hour	$15 per hour	$4.80–$9.60 per hour or fixed monthly charge [D]
Monthly charge	$14 per user (includes 1 hour online and 100K traffic)	none	$5000 minimum [D]
E-mail surcharge	none	$0.90 per page	none
Download surcharge	$0.04 per kilobyte	$0.08 per kilobyte	none
Support	toll-free phone, 7 am–6 pm PST, M–F	toll-free phone, free, 8:30 am–8 pm ET, M–F	toll-free phone, 16 hours a day, 7 days a week

[A] Also available: Forum, a less expensive, less customizable version; tools for programming highly specialized systems. [B] Formerly called BusinessTalk System 2000. [C] Depends on quantity. [D] Depends on number of users.

PressLink, which includes online access to news photos.

Business Network, which has been around in one form or another for about a decade and until recently was called BusinessTalk System 2000, lets you build a private online-information service over GE Information Services' global communications network. The majority of Business Network customers are large companies, like Apple, that use it to offer end-user services and for business-to-business communications. GE says that only about 200 Business Network systems are installed, but they are accessed by more than 25,000 businesses.

Business Network systems can be configured to provide access to other E-mail systems including the Internet, as well as to Dow Jones News/Retrieval Service and a personalized news service called QuickNews. (GE's consumer-oriented online service, GEnie, cannot be accessed from Business Network.)

Like Connect, GE can provide you with either a highly customized system or one that is minimally customized, but the way GE costs it out is quite different from the way Connect does.

The major expense of setting up a Business Network system is the cost of client software, which comes in Macintosh, Windows, and DOS versions. For small orders—less than 50 copies—GE charges $249 per copy; for 500 copies or more, the price drops to $100 each. Site licenses are available for $30,000. Once you have the software, GE says, you can get onto the network in a matter of hours—as soon as your system operator enters your user IDs and passwords. GE doesn't charge a start-up fee, but adding your company logo and welcome menus costs about $2000. An environment supporting large databases and providing a highly customized front end will cost between $10,000 and $50,000, depending on its complexity, not on the number of users.

GE charges $15 per hour for connect time, 8 cents for every 1000 characters downloaded, and 95 cents a page for E-mail. The company does not charge a monthly minimum.

Your Business Network system can be administered locally using software that runs only on Windows. GE also has software for processing electronic forms on its system; the forms-design module is Windows-only, but the fill-in module is available for the Mac.

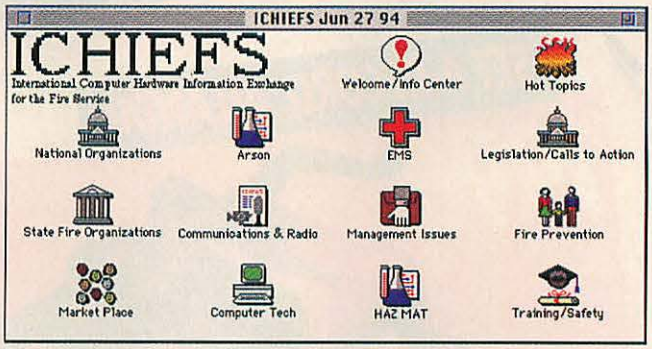
The Last Word

Should your organization make the move to its own communications system? And if so, which provider is right for your organization's needs? To answer the first question, you need to do a cost-benefit analysis, taking into account current E-mail expenses, how much of your long-distance faxing—not to mention travel—your own system might eliminate, as well as intangibles such as how it could improve relations with your customers. And remember, a private online-information service is designed to be just that: private. Unlike with publicly accessible systems, such as America Online and Prodigy, you control who has access to your service and what parts of it they have access to. In fact, your service may run on the same mainframe system as your competitors' service, but since each is completely isolated, you avoid such abuses as your competitors' checking out your pricing schedules or their customers' using your tech-support staff.

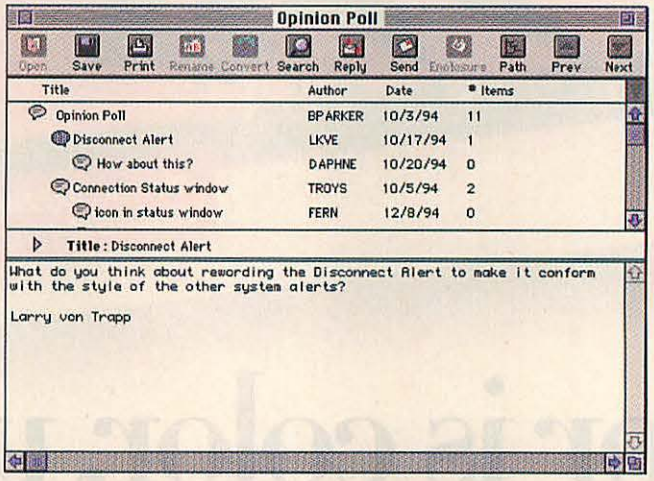
Answering the second question, which system to base your service on, is different from deciding which monitor or disk drive to buy. Unlike a hardware purchase, choosing a provider isn't a simple matter of determining that GE, Connect, or CompuServe has the best product. Each offers something very different, so you need to decide what you want to provide for your users; then you can determine which vendor has the best price for that set of capabilities. ■

MARTHA STRIZICH writes frequently about networking and telecommunications.

CompuServe For its Private Forum customers, CompuServe provides the same interface software, CompuServe Information Manager, as it does for its public system, but with additional icons that lead to areas accessible only by forum members.



Connect This is a Virtual Private Network run by Connect for the International Association of Fire Chiefs. The association uses its online system to trade information on everything from hazardous materials to legislation.



GE Information Services A discussion taking place on a Business Network system managed by GE. The indented arrangement of messages indicates that they are threaded—that is, some messages are replies to other messages, instead of all messages forming one series.

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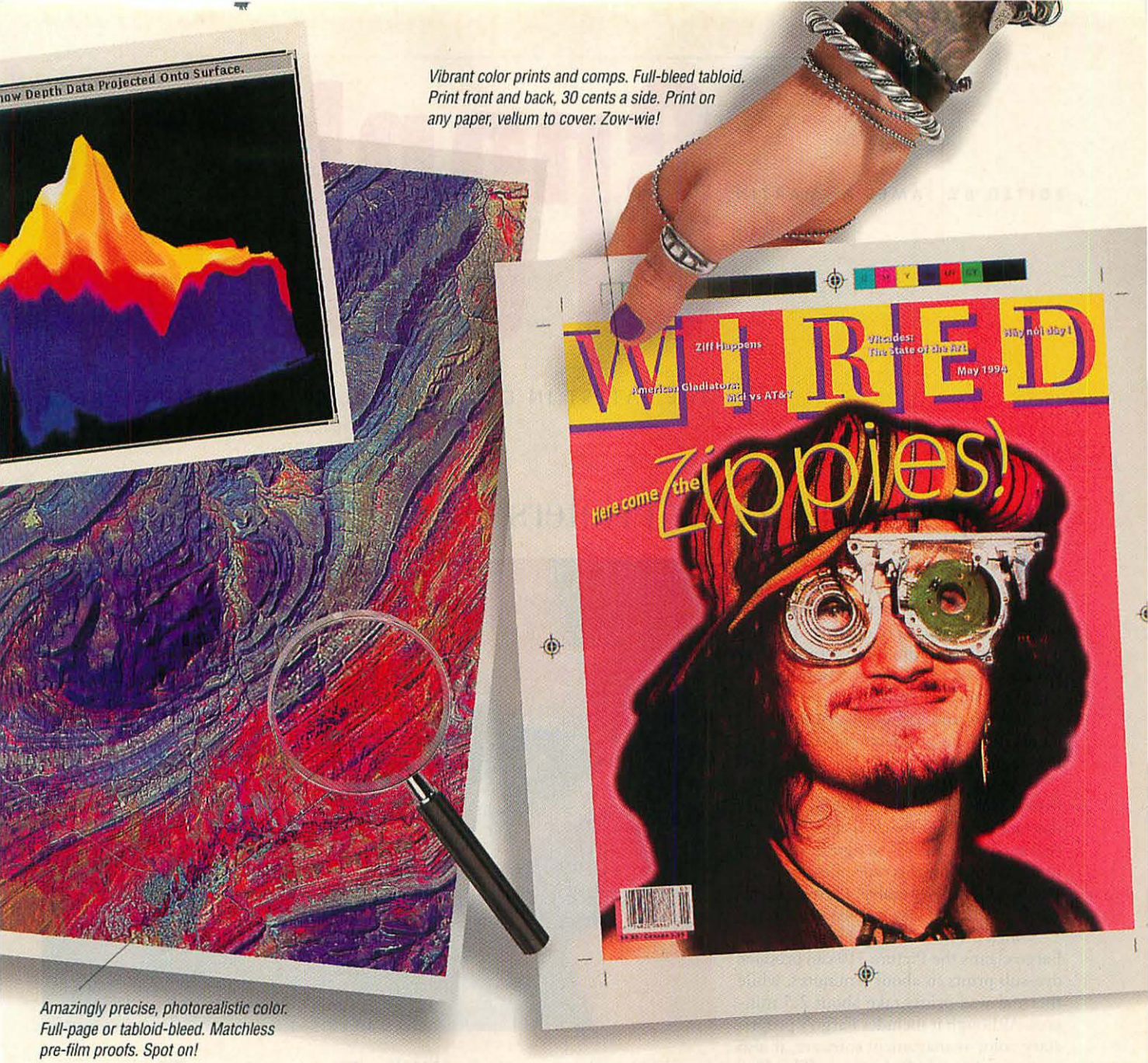

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Circle 143 on reader service card

EDITED BY JAMES A. MARTIN

Graphics

THE LATEST IN DESIGN, PUBLISHING, AND PREPRESS

Cheaper, Better Color Printers

GRAPHICS PROFESSIONALS WHO want photo-realistic color output without spending a fortune will be glad to know that the cost of quality is coming down. A dye-sublimation printer from Kodak is priced at about $10,000, one from General Parametrics costs less than $8000, and a dye-sub–thermal-wax combo from Fargo Electronics can be had for about $5000.

• The Pictura 310 Color Printer from Fargo Electronics is a combination dye-sublimation–thermal-wax printer that retails for $4995—a significant price breakthrough for this type of technology. Due to ship in November 1994, the 300-dpi Pictura produces full-bleed 11.5-by-17.5-inch prints on 12-by-18-inch sheets. Fargo claims the Pictura 310 can produce dye-sub prints in about 8 minutes, while thermal-wax prints take about 2.5 minutes. Although it includes Fargo's proprietary color-management software, it also supports Apple's ColorSync. The Pictura's low cost is partly due to the fact that it has no motherboard but instead uses the Mac's CPU for processing images (RIP time is about 5 to 7 minutes). Included with the printer is a NuBus board to install in your Mac for fast transfer of large print files. An optional PostScript driver will cost an additional $599. Per-page print cost is $6.58 for dye-sub.

• General Parametrics is introducing the $7695 Spectra Star DSx, a dye-sublimation printer that handles both three- and four-color continuous-tone printing. It produces full-bleed 600-dpi prints (full-bleed A4 size for international markets) on oversize media for a maximum image size of 9.3 by 12.7 inches. The DSx includes PostScript Level 2 capability and Pantone color matching. The printer comes standard with a 33MHz RISC processor, 16MB of RAM expandable to 96MB ($1495 per 16MB), and two plug-in–cartridge slots—one for a 170MB internal hard drive ($895) and another for adding Ethernet support ($795). Per-page print cost for full-bleed is $2.85.

ROBERT PERRY

• The $9995 Kodak XLS 8600 PS is a 300-dpi PostScript Level 2 printer that produces full-bleed output of up to 8.5 by 12 inches on 9.5-by-14-inch media using Kodak's UltraColor rendering. Its 32MB of RAM is upgradable to 48MB or 64MB, and its multisensing ports can handle SCSI, Centronics, and LocalTalk, with optional support for Ethernet ($995). The printer ships with 35 resident fonts and 30 downloadable fonts. An optional external hard drive to store them will be available in November. Approximate cost per full-bleed page is $2.50, and $3 for transparencies.

Fargo Electronics, 612/941-9470; General Parametrics, 510/524-3950; Eastman Kodak Company, 716/253-0740.—CATHY ABES

Powering Up Photoshop

A NEW "ADOBE-CHARGED" DSP accelerator board from Adaptive Solutions—PowerShop—is expected to deliver the kind of speed for Photoshop that graphics professionals have long been seeking.

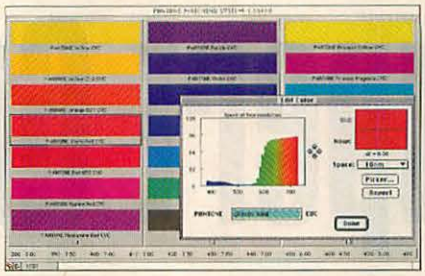
With 64 DSPs working in parallel on one NuBus card, PowerShop is designed to accelerate such computation-intensive functions as RGB-to-CMYK conversions, unsharp mask, and gaussian blur between 5 and 30 times as fast as a Power Mac 8100.

The board supports all NuBus Mac models, from the IIci to the Power Mac 8100. Due by the end of 1994, PowerShop will retail for $3995. Adaptive Solutions, 503/690-1236.—CATHY ABES

Desktop Color Clearinghouse

COLORDRIVE, A NEW color-management system from Pantone, lets you calibrate Pantone and custom color palettes for export to a variety of graphics programs, including Adobe Photoshop and Illustrator, Aldus FreeHand and PageMaker, and QuarkXPress—eliminating the need to redefine colors for each application.

You can also use ColorDrive to match colors from a photo or illustration by measuring the color with a spectrophotometer. Using the measured data, ColorDrive replicates the color and adds it to your palette. In addition, ColorDrive can import, color-correct, and export photos, line art, charts, and graphs in TIFF or PICT format. Palettes can be saved in RGB, CMYK, and EPS formats.



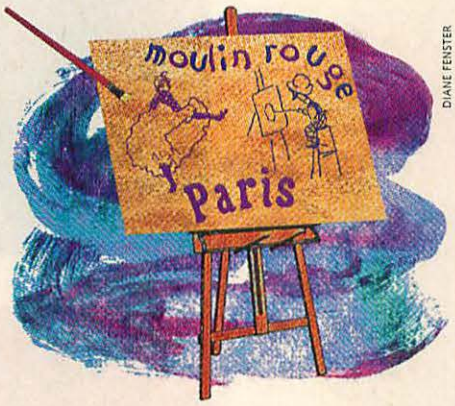
As part of its color-palette customization capabilities, ColorDrive lets you view and edit the spectral components of a specific color.

ColorDrive manages color-calibrated output from any Pantone-licensed printer, as well as those with ColorSync-compatible profiles. The $199 ColorDrive, with 680X0 and Power Mac versions in one package, is due by the end of 1994. Pantone, 201/935-5500.—CATHY ABES

Oh Là Là! Toulouse-Lautrec, the Typeface

SHOPPING FOR FONTS THIS FALL? Among the latest releases are typefaces inspired by Toulouse-Lautrec and Frank Lloyd Wright, plus new Multiple Master faces from Adobe Systems.

Monotype Typography's Toulouse-Lautrec Collection, designed by Luiz DaLomba, pays homage to the French post-impressionist with four type styles and a selection of clip art (accessed with keystrokes). The collection will be available in November for $130.



DIANE FENSTER

Agfa's Eaglefeather, designed by David Siegel and Carol Toriumi-Lawrence, is based on lettering designs by Frank Lloyd Wright. Eaglefeather Formal and Eaglefeather Informal each contain six weights and cost $210 each; a three-weight small caps version is $105. All three volumes are $345, or you can buy individual fonts for $45 each.

Adobe has released four new Multiple Master faces. Nueva ($105), designed by Carol Twombly, is a display face with two design axes, weight and width. Penumbra ($105), by Lance Hidy, is an all-capital face with weight and style axes; the style axis allows you to transform Penumbra characters from a light sans serif to a bold serif. Also available are ITC Motter Corpus ($75) by Othmar Motter, an extrabold display face with a weight axis; and ITC Garamond ($145) by Tony Stan, with weight and width axes.

Adobe has also updated its font CD-ROM Type On Call. Version 4.0 has multilingual support, automated ordering, and an electronic catalog for viewing and printing typeface samples. The CD is $69 through January 31, $99 afterwards, and includes a choice of any two of eight designated typeface packages.

Monotype Typography, 312/855-1440; Agfa, 201/440-2500; Adobe Systems, 415/961-4400.—J.A.M.

IN BRIEF

■ **Apple Licenses Chameleon** Future versions of Apple's operating system and printers will include Ares Software's Chameleon technology. Used in Ares's FontChameleon program, Chameleon automatically generates TrueType and PostScript Type 1 fonts from master outlines and preset descriptor files. Combined with QuickDraw GX, Chameleon is expected to offer enhanced document portability, as well as better font selections and type effects, requiring minimal RAM and disk space.

■ **Printing to the Edge** SummaGraphics' $8495 SummaColor 1117 is a PostScript Level 2 thermal-transfer printer that produces tabloid-size pages and includes 39 Type 1 Adobe fonts. ColorSync-compatible, it automatically switches between AppleTalk, Centronics, serial, and SCSI, and provides optional Ethernet support; its 12MB of RAM is upgradable to 136MB. Expected ship date is November 1994. 512/835-0900.

■ **Type Effects in Illustrator** Letraset's $99 plug-in for Adobe Illustrator lets you distort and reshape text using what Letraset calls distortion envelopes. The plug-in includes 40 distortion envelopes; a package of 160 additional envelopes sells for $199. 201/845-6100.

■ **PixelCraft's 10-Bit Scanner** Able to capture images at 10 bits per color channel, the $2995 Pro Imager 4000 features 600-by-2400-dpi resolution, cold-lamp technology, and built-in transparency scanning. 510/562-2480.

Easy Color Separations

POLAROID'S PRINT-TO-PRESS COLOR-calibration software lets you retouch and color-separate Polacolor Pro 100 prints (Kodak's new instant color film designed for professional photographers) using the Polaroid CS-500i Digital Color Scanner. Future versions will support other film and hardware.

Developed by CyberChrome (a color prepress service bureau and codeveloper with Quark of the DCS format), Print-to-Press consists of two filters, a Photoshop plug-in that controls colors during scanning and an RGB-to-CMYK converter that matches the final colors to the original photograph, to produce an accurate color proof. Due to ship in the first quarter of 1995, Print-to-Press will retail for $3500. Polaroid Corporation, 617/386-2000.—CATHY ABES

Expert Graphics

GRAPHICS PROFESSIONALS SHARE THEIR SECRETS

by Cathy Abes

Artist: Annabelle Breakey is a San Francisco–based photographer who specializes in digital imagery. She has been a guest lecturer at the Academy of Art College in San Francisco. Her advertising clients have included Canon USA, Logitech, and Sprint. The image shown here appeared in the Digital Image Exhibition of the 1994 Photoshop Conference.

How It Was Done: Originally created for a client's marketing brochure, this image, called "Global Strategy," was redone as a stock photo for Tony Stone Images, a stock-photo agency. Breakey began by photographing a piece of wrapping paper containing an image of an antique map of the world. After scanning it into Photoshop, she rotated it to the angle she wanted—about 45 degrees counterclockwise. Because rotating it produced blank areas at the top and bottom, she had to fill those areas by cloning and copying/pasting from various parts of the map.

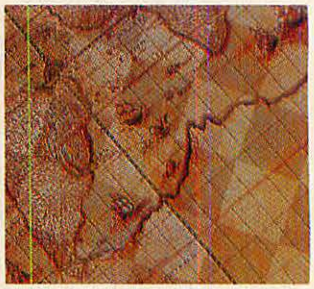
Next, to provide a more textural, three-dimensional look and eliminate the moiré pattern that resulted from scanning the wrapping paper, she used Photoshop's Emboss filter on a copy of the map, then composited the copy with the original. After adding a checkerboard pattern to the map, she darkened half of the squares and lightened the other half with Brightness/Contrast.

At this point, Breakey began placing the chess pieces on the map/checkerboard background. For each of the chess pieces, she made a shadow by drawing a path around the piece and scaling it to make a long, thin shape. Then she made a path from the selection (Path palette). After exaggerating the shape to give it more definition, she saved the path and made it a selection (because paths can't be rotated). Once she had pasted the selection into the main image at minimal opacity, she rotated the selection to the correct angle. Then, so she could more easily and precisely refine the shape, she made it into a path, saved it, selected it with a 10-pixel feather, and darkened it with Brightness/Contrast. **m**

1 A detail of the original map, taken from a sheet of wrapping paper the artist scanned into Photoshop.

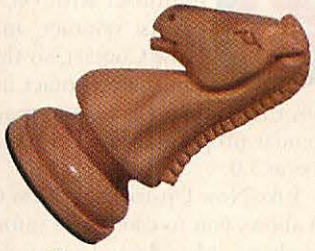
2 With the whole image selected, Breakey copied it and applied Photoshop's Emboss filter to the copy.

3 To remove the gray produced by the Emboss filter, she pasted the embossed copy over the original map using Composite Controls in Lighten mode at 80 percent opacity, then deselected. To enhance the colors, she boosted the saturation to about +45, then –10 Brightness, +10 Contrast.



4 Using the pen tool to make a grid for the checkerboard pattern, she selected alternating squares and darkened them with Brightness/Contrast, then used the Inverse command to select the other half and brightened those, to complete the checkerboard effect.

5 The original photo of the chess pieces scanned into Photoshop. Some were placed on the map; others were used only to create shadows.



6 To create a shadow of the knight, Breakey made a pen-tool path around the piece, made a selection from the path, copied the selection, and pasted it into a new document, rotating the selection until it was horizontal.

7 Using the Scale command without constraining it (Image> Effects), she stretched out the chess piece to make a long, skinny shape for the shadow.

8 Pasting the selection made from the path into the illustration at 1 percent opacity made the shadow completely transparent. After rotating the shadow selection and making it a path (at 1.3 tolerance), she saved it, selected it with a 10-pixel feather, and reduced Brightness to –80 and Contrast to –15.

THE TOOLS

Hardware: Mac IIci with 64MB of RAM and a 210MB internal hard drive; DayStar Digital 40MHz accelerator board; 1GB external hard drive; 44MB SyQuest removable-cartridge drive; 21-inch SuperMac monitor; Wacom ArtZ ADB 6" x 8" tablet.
Software: Adobe Photoshop 2.5.1.

EDITED BY DAN LITTMAN

At Work

THE LATEST TOOLS FOR BUSINESS COMPUTING

Now Contact Goes Multiuser

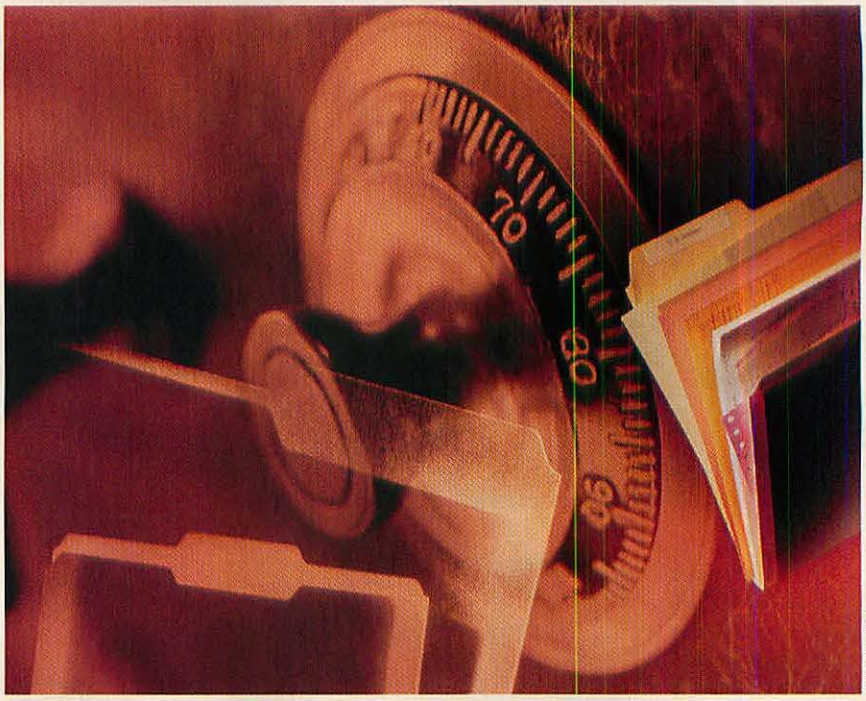
NOW SOFTWARE IS GOING multiuser with version 3.0 of its contact manager, Now Contact, so that users can share contact information; the company is also upgrading its calendar program, Now Up-to-Date, to version 3.0.

Like Now Up-to-Date, Now Contact 3.0 allows you to categorize information and share only selected categories with other users. For example, you could categorize some records as business contacts and others as friends, and make only the business-contact records available on the network; you could also make shared contacts' name, company, and phone fields available, but keep the Bozo Warning field to yourself.

Other Contact 3.0 news includes duplicate-record elimination and the ability to synchronize multiple versions of the same file (this is most helpful for PowerBook users); the ability to automatically fill in information when the program recognizes the first few letters of something you type; and a way to search across multiple fields by using predefined keywords. The new version also has new field types for money and dates.

Now Up-to-Date 3.0 provides a button bar for quick access to features, can search through numerous people's calendars to find a time when all are free to meet, and can track the duration of phone calls.

Now Software says Contact 3.0's street price will start at about $50 and Up-to-Date's street price will start at about $65, with bulk purchases and bundles available for less. To share information between the two programs requires upgrading to version 3.0 of both. Contact runs in native Power Mac mode; Up-to-Date does not. Both should be shipping as you read this. Now Software, 503/274-2800.—D.L.



WILL CROCKER

Common Ground Widens Territory

NO HANDS SOFTWARE IS UPGRADING Common Ground, its Adobe Acrobat competitor, to version 2.0 (see *At Work* news, December 1994). The electronic document-distribution tool is adopting TrueDoc, a new font format developed by Bitstream that can display or print text in its original font at any resolution, without requiring the font to be embedded in the document.

Other features new to 2.0 include the ability to convert PostScript files into the Common Ground portable-document format; the digital equivalent of bookmarks and highlighting; a hyperlinks feature for embedding paths and cross-referencing in documents; and a table-of-contents generator. Password-protection is available to block unauthorized reading, copying, or printing of Common Ground documents, and the product also includes DES encryption. Another new feature makes it possible to extract pages from multiple source documents and combine them as one Common Ground document.

Both Common Ground and Acrobat are getting features that make their documents easier to access over the Internet. Spyglass plans to add support for Acrobat's document format to version 2.0 of Enhanced NCSA Mosaic, Spyglass's commercial version of the graphical Internet front-end, while No Hands is

adding support for WAIS, the search-and-retrieval engine for Internet servers, to Common Ground 2.0.

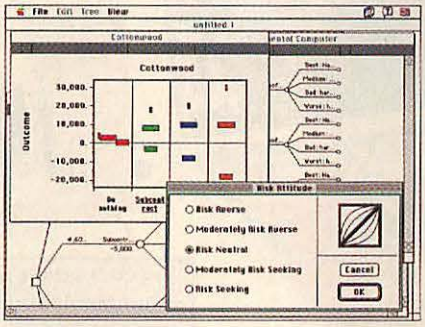
Common Ground 2.0 should ship before the end of 1994 and will list for $189.95. A separate product, as yet unnamed and unpriced, will batch-process files into CG format. No Hands, 415/802-5800; Spyglass, 217/355-6000.—D.L.

Decisive Software

PALO ALTO SOFTWARE IS LAUNCHING a new series of products designed to help business owners and managers run their organizations more effectively. Palo Alto Software has been known for its long line of Excel add-ons, such as Business Plan Toolkit and Marketing Plan Toolkit, but the first product in the company's new Business Essentials Library line, DecisionMaker, is a stand-alone application.

With DecisionMaker, you set up a decision tree—a branching diagram showing each possible outcome in a series of events—and then weight each possibility with an estimated likelihood and its desirability or undesirability. The tree can be expressed in terms of money or other values, and the model calculates best-case, most-likely, and worst-case values. Decision trees are especially useful when several experts in different fields are collaborating on a project, because this type of analysis requires each person to describe explicitly assumptions that are normally not articulated. DecisionMaker should be shipping for $149.95.

Palo Alto's next Business Essentials product, which should ship early in 1995, is called Cash. It is a small-business accounting system that focuses on liquidity rather than profit, so that the business owner can know what business needs are within reach and when cash-flow crunches are likely to occur. Cash will list for $149.95. Palo Alto Software, 503/683-6162.—D.L.



A DecisionMaker model in decision-tree format with a graph showing various projected outcomes.

Extracting the Essence of Data

ARBOR SOFTWARE IS SHIPPING A MAC client to Essbase 3.1, a client/server system that makes data residing in corporate databases available for financial analysts, marketing planners, and others to explore from within Microsoft Excel.

Rather than replicating flat database tables and propagating them into row-and-column spreadsheets, Essbase, with the help of a system administrator, reorganizes the data to create a multidimensional data space in which all related information is linked together. For example, one dimension might hold a hierarchical set of months, quarters, and years; a second dimension might hold product lines; a third might hold data on costs, sales, and profits; and a fourth might contain region and division relationships. A simple click or two could extract changing profit margins over time, compare the life cycles of several product lines, or show which products have higher variation in sales by region than expected. Once disparate data has been mapped into the structure Essbase needs, users can perform ad hoc drill-downs, summaries, cross-tabs, and so on from inside Excel without using SQL or other query languages.

PETER HOEY

The Essbase server can collect data from SQL hosts, mainframes, and other live databases, while the Essbase server itself runs on either OS/2 or Windows NT. Arbor Software is developing a server that runs under Unix on Hewlett-Packard systems. Arbor then plans to do a server for IBM's AIX; the company thinks the AIX server will run on PowerOpen Unix, a version of AIX that will run on the Power Mac. The pricing structure is complex, but a complete system starts at $35,000 for five users, including a report-generator language for batch processing; Arbor charges an additional 15 percent for the programming tool kit. Arbor Software, 408/727-5800.—D.L.

IN BRIEF

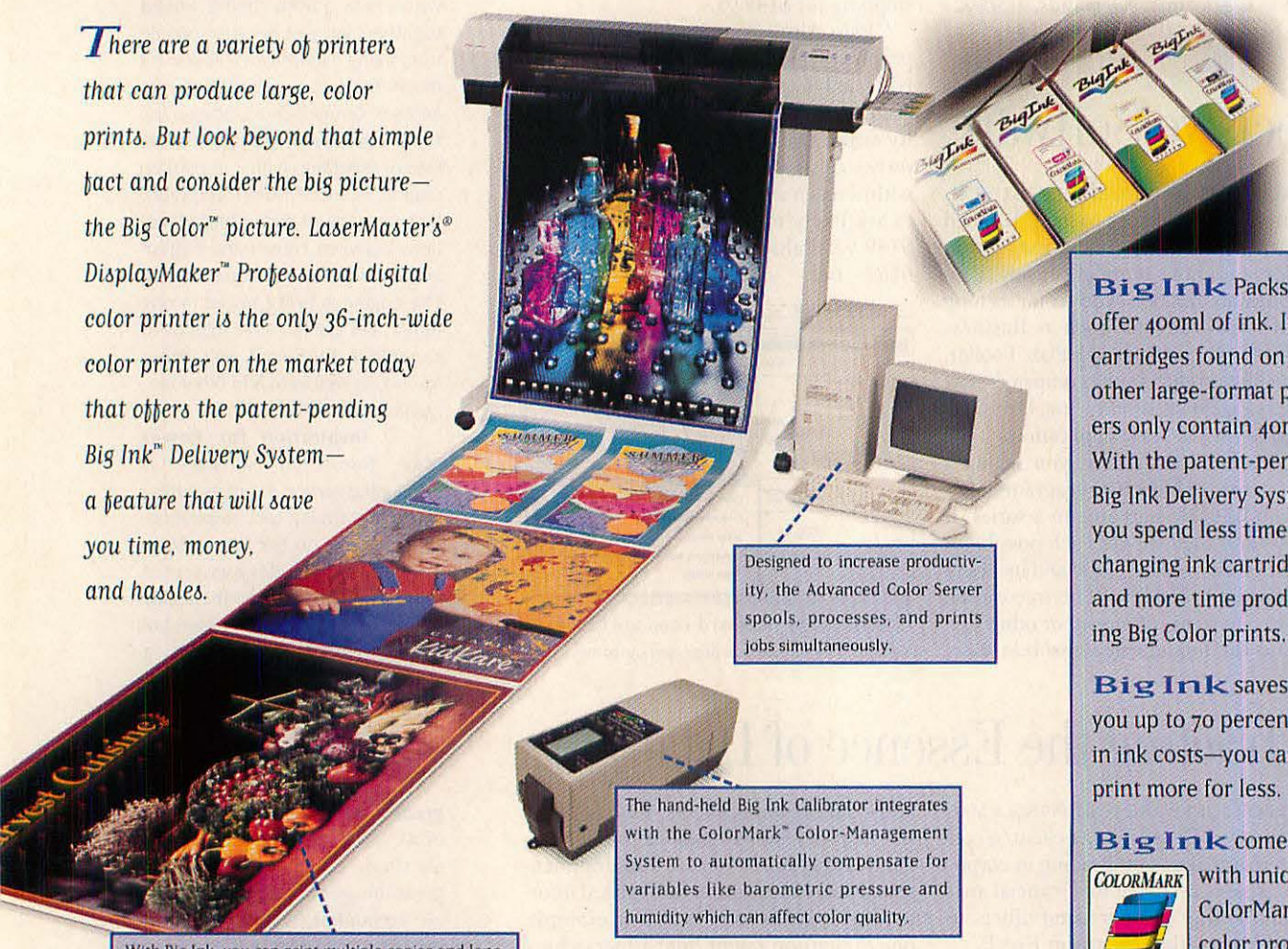
■ **CompuServe's Translation Experiment** Most of the world's publicly accessible networks are quickly being linked together, but just because people from many nations can talk doesn't mean they can understand one another. CompuServe is attempting to turn this tower of Babel into the land of Esperanto with a translation engine, licensed from Intergraph, that can convert text in both directions between French and English and between German and English. The engine is being tested in one forum, but CompuServe intends to expand it to E-mail and other forums, as well as to add other languages. 614/457-8600.

◀ **Inspiration for Power Mac** Inspiration Software is developing version 4.1 of its outlining/brainstorming tool, Inspiration, to run native on the Power Mac. The upgrade also adds a vast set of new flowchart symbols, the ability to insert or delete a symbol between two other symbols, a spelling checker, and RTF import. Version 4.1 should be shipping now at a street price of about $130. 503/245-9011.

◀ **Two Accounting Upgrades** BestWare's new version of M.Y.O.B., 5.0, asks a series of questions during installation to guide the user toward an appropriate accounting system. The new version, whose price was not set at press time, also has a built-in backup feature. CheckMark Software's new MultiLedger 4.0 has more-flexible reporting capabilities and expanded support for job-tracking and job-costing. The new version, which runs in native mode on Power Macs, is multiuser and supports up to ten users on a single $199 copy. BestWare, 201/586-2200; CheckMark, 303/225-0522.

Get More Than 1000 Square Feet Per Ink Set!*

There are a variety of printers that can produce large, color prints. But look beyond that simple fact and consider the big picture—the Big Color™ picture. LaserMaster's® DisplayMaker™ Professional digital color printer is the only 36-inch-wide color printer on the market today that offers the patent-pending Big Ink™ Delivery System—a feature that will save you time, money, and hassles.


Big Ink
Big Ink
Big Ink

BY JIM HEID

Working Smart

Using the Finder Efficiently

MACROS, WIZARDS, TEMPLATES, TOOL bars, AutoThis, PowerThat—developers are loading applications with features that make computing more productive and more efficient.

But what about time spent outside applications, in the Mac's Finder? Tracking thousands of files, navigating folders, mounting file servers, tweaking system settings—chores like these can really eat into your time, turning your Mac from productivity booster to ball and chain. What's a knowledge worker to do?

The Macintosh system software provides numerous features that streamline Finder grunt work; and a variety of utilities, some free or shareware, can also help. This month's column provides answers to Finder productivity issues. And modem owners, take note: I've posted the free and shareware utilities discussed here in *Macworld*'s America Online and eWorld forums.

Problem: Locating files that are buried deep in folders.

Solution: Use aliases and a hierarchical Apple-menu utility.

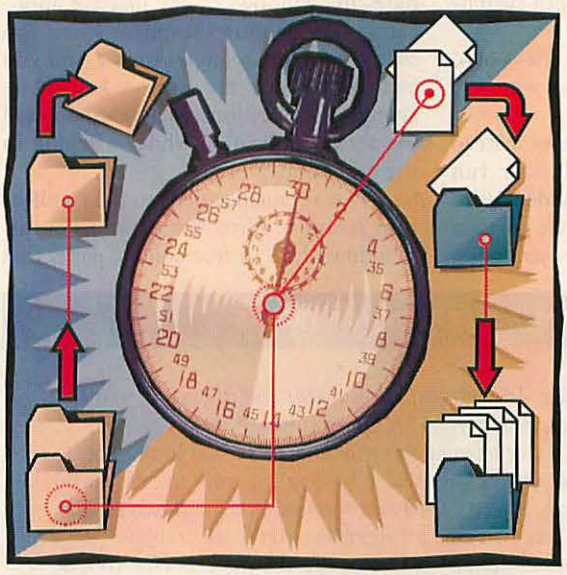
Categorizing your files with plenty of folders—for business software, graphics software, games, memos, spreadsheets, business plans, novels—is by far the best way to keep your hard drive organized. But when you start tucking folders within folders within folders, finding a file can send you on an odyssey of double-clicking. One answer: the alias. Select a frequently used application or document buried within a folder, choose Make Alias from the Finder's File menu, and drag the alias out to the desktop. Next time you need the file, you can open it by clicking on its alias; the original remains filed where you want it. Or better yet, stash the alias in the Apple Menu Items folder in the System Folder and it'll appear on the Apple menu.

You can also dramatically increase the Apple menu's usefulness with a hierarchical Apple-menu utility, such as Alsoft's MenuExtend (included with Alsoft Power Utilities 1.0.6; $129; 713/353-4090, 800/257-6381) or Kerry Clendinning's $15 shareware utility MenuChoice 2.0; these utilities turn folders and aliases of folders into submenus, allowing express access to even the most deeply nested files (see "Efficiency Experts"). Apple liked the concept so much that it includes a hierarchical Apple menu in System 7.5.

Problem: Logging on to a file server.

Solution: Create a file-server alias.

If you use a network file server or System 7's file sharing, you know the tedious steps required to mount a remote volume: open the Chooser, click on the AppleShare icon, select a file server, type a password, choose the volumes you want . . .



The amazing alias can help here. Make an alias of any server you use frequently, and you'll be able to mount the server just by double-clicking on its alias. If you specify a password—which, in these times of file sharing and Apple Remote Access, you'd better—the mounting procedure will pause while you enter the password. And here's a cool way to access a server volume or folder, or even your own shared hard drive, from anywhere on the network: make an alias of it on a floppy disk, and when you need to log on, sit down at any Mac on the network, insert the floppy, and double-click on the alias. (Now aren't you glad you gave your own drive a password?)

Problem: Turning file sharing on and then turning file sharing off.

Solution: Use simple macros.

System 7's file sharing is great for beaming data between Macs. But you don't want to leave it on when you don't need to share files, because it slows down your Mac, and toggling via the Sharing Setup control panel is too much work. CE Software's QuicKeys 3.0 ($139; 515/224-1995, 800/523-7638) includes an extension called System 7 Specials that can turn file sharing on and off with one keystroke. A similar QuicKeys extension, Choosy, lets you bypass the Chooser when switching between printers.

In the freeware/shareware arena, there's Steve Forgacs's free FileSharingToggle 1.0.4, a simple program that toggles file sharing. And no frequent filer should be without Robert Hess's $10 Shaman 1.1.0, which can toggle file sharing; display an icon in the menu bar to indicate when sharing is on; and, if you have Apple's PlainTalk Speech Manager extension, even tell you aloud when someone logs on or off.

Problem: Switching monitor-depth settings is awkward.

Solution: Use a utility that can switch bit depths for you.

All color Macs support a variety of monitor settings ranging from black and white (1 bit), to 16 colors (4 bits), 256 colors (8 bits), thousands of colors (16 bits), or even millions of colors (24 bits). When not working in color, you can

continues

ROB DUDLEY

increase your Mac's performance on certain tasks by setting it to black and white—for example, your word processor will scroll much faster in black and white than in color. But then you'll want to switch back to color for QuickTime movies, graphics, or playing Myst.

QuicKeys' Screen Ease extension provides keyboard shortcuts for depth switching. You can choose a specific depth, such as 256 colors, or you can set Screen Ease to increase or decrease the depth each time you type a command.

Another handy depth switcher is Ambrosia Software's $10 shareware ColorSwitch 2.3.0, which adds a menu to the right edge of the menu bar, listing available bit depths. (You can also specify that the menu appear under the mouse pointer when you type a command—convenient for large-screen monitors.) ColorSwitch also lets you change the Mac's speaker volume without going through the Sound control panel (QuicKeys provides a similar feature).

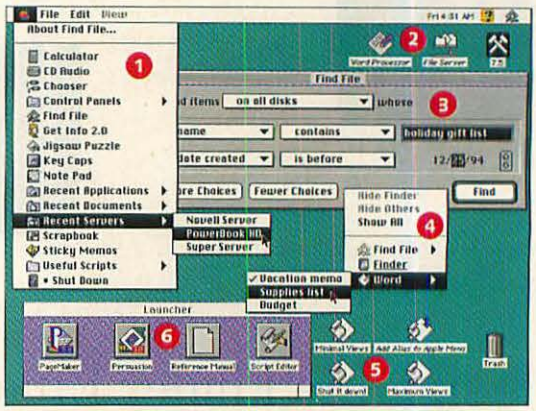
Then there is the shareware file-launching utility Apollo 1.0, which lets you create an always-available menu of your favorite applications and often-used documents, and can also switch automatically to a specified bit depth when you start a particular program. Depth switching doesn't get any easier.

Problem: Opening folders is sl-o-o-w.

Solution: Customize the way the Finder displays windows.

Using the Finder's list views instead of iconic views makes the Finder run faster; in an iconic view, the Finder has to retrieve from its internal database the icon for every file in every window you open and then display those icons. The Finder's list views—Name, Kind, Size, and Date under the View menu—don't impose this overhead. But list views often contain information you don't need—do you really need the creation date for every file?—and that slows down the Finder as well. Use the Views control panel to pare down what information appears (and don't forget to turn off Calculate Folder Sizes, which constantly totals up the size of all the files in a folder).

Note that removing list-view items means you won't be able to sort by those attributes—for example, if you uncheck Size, you won't be able to sort windows by file size.



Efficiency Experts This composite illustration shows six ways to make your computing time more efficient. (**1**) A hierarchical Apple menu (System 7.5's is shown here). (**2**) Aliases of often-used items on the desktop. (**3**) The System 7.5 Find File desk accessory. (**4**) A hierarchical Application menu, created by the free ApplWindows utility. (**5**) A variety of scripts for switching monitor settings and controlling file sharing. (**6**) The System 7.5 Launcher.

Problem: Desktop clutter.

Solution: Use the Macintosh's application-hiding features or utilities.

The Mac's desktop metaphor is great, but does it have to be so accurate? I'm referring to the clutter of too many open windows. One solution is to choose Hide Others from the Application menu at the right-hand edge of the menu bar, which hides the windows of any inactive application. (Its windows reappear when you switch back to the application.) And you can hold down the option key while changing applications, to hide windows of the active application while switching to the other one.

A great enhancement to the Application menu is Hiro Yamamoto's ApplWindows 2.0.2, a free control panel that displays all open documents for each application in the Application menu so that you can switch to a particular document as you switch applications. ApplWindows can also display its hierarchical Application menu on command at the mouse pointer's location. And do you still long for System 6's MultiFinder, which let you cycle through open programs by clicking on the Applications icon instead of pulling down a menu? ApplWindows supports that, too.

QuicKeys' ProcessSwap extension also provides an automatic hiding feature. And there's Jeff Winkler's Hide Others 1.0 freeware, a control panel that hides inactive applications when you press a key that you designate.

None of these goodies can really eliminate the clutter that builds up within applications. For that, there's Rob Johnston's free WindowShade 1.2 control panel, which can "roll up" a window—that is, hide everything except the title bar of open documents.

AppleScript: Automated Efficiency

System 7.5 provides many of the efficiency features that required add-on utilities under System 7.0: a hierarchical Apple menu (it even lists recently opened documents, applications, and file servers); an automatic application-hiding feature; and a copy of WindowShade. But from an efficiency standpoint, the most exciting thing about System 7.5 is that its Finder supports Apple's wide-ranging automation language, AppleScript. AppleScript has been around for a couple of years now, but support for it has been conspicuously absent from the Mac's Finder.

continues

SYSTEM 7.5 EFFICIENCY TRICKS

Apple has packed System 7.5 with numerous utilities and commands to make using your Mac more efficient. Here are tips on a few of them.

Find File Here's an undocumented tip on System 7.5's Find File desk accessory. You can fill in the query terms for a search by dragging icons to the search-term text boxes. For example, to find PageMaker files, set up the first two pop-up menus to read File Type Is and then drag a PageMaker icon to the text box.

Launcher Macintosh Performa users have enjoyed the Launcher control panel for some time; now it's available to the rest of us. Put applications or documents (or better, aliases for them) in the System Folder's Launcher Items folder, and you have one-click access to often-used items. It beats adding things to the Apple menu, because its window is always visible and it shows file icons as well as names.

Extensions Manager This control panel lets you enable or disable system extensions; it, or a utility like it, is essential for controlling conflicts and crashes caused by uncooperative extensions. A handy feature in System 7.5's Extensions Manager is the ability to turn off all third-party extensions and start up with only the standard System 7.5 extensions.

Keyboard Command for Make Alias It's about time there was one, and it's ⌘-M. (If you're still using System 7.0, you can create a QuicKeys shortcut for Make Alias.)

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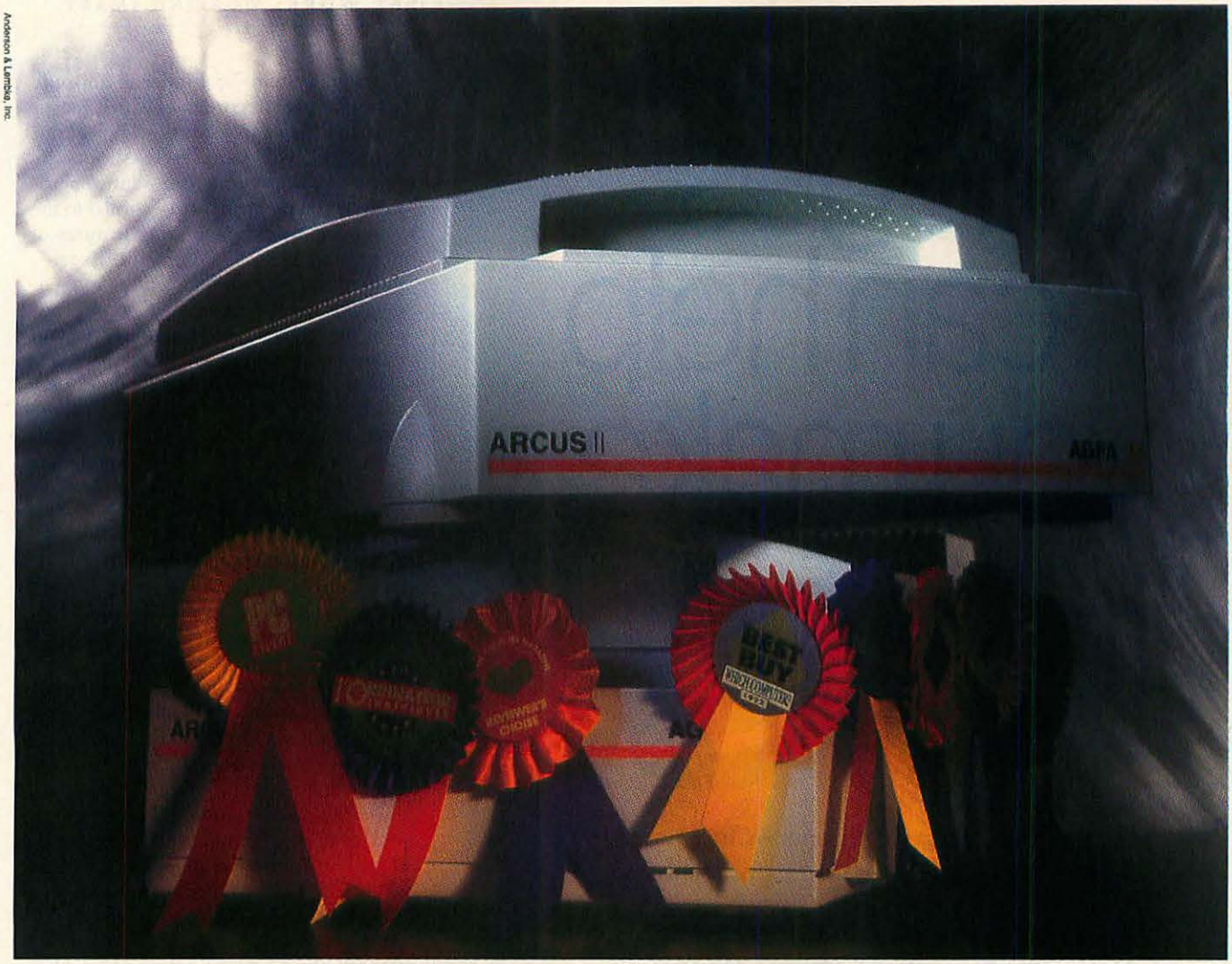

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The System 7.5 Finder is not only scriptable, it's recordable, which means you don't have to learn the AppleScript language. You can create scripts by recording the actions you want to automate as you perform them—similar to the watch-me macro-generating features of programs such as Microsoft Excel—though recorded scripts are often too specific and need some editing to work properly in a variety of situations. As you choose commands, you'll see the script appear in the Script Editor window. After tweaking the script, save it as an application and stash it in the Apple menu. (I have posted a collection of useful sample scripts on the *Macworld* forums on America Online and eWorld.)

Unfortunately, some System 7.5 components are not yet scriptable. I ran into this roadblock with a script to open the Scrapbook and paste in the Clipboard's contents: the Scrapbook isn't scriptable, so the script didn't work. Creative scripters can work around limitations like these by combining AppleScript scripts with QuicKeys macros. Still, Apple's slow-and-steady approach to implementing scripting is frustrating.

A bigger frustration is the nearly total lack of documentation on Finder scripting. The Apple Extras folder contains some AppleScript documentation but nothing about System 7.5's Finder. To whet your appetite, open the Finder's dictionary using Script Editor's Open Dictionary command. (In AppleScript-speak, a dictionary is the set of terms—commands, objects, and so on—that a scriptable application provides.) There are no examples of how to use the terms, which run to nine single-spaced pages, but you'll understand what many of them are for just by their names.

For now, the best way to learn Finder scripting is to dismantle existing scripts and to practice creating your own. You can also read Derrick Schneider's great primer, *The Tao of AppleScript* (Hayden Books, 1993). A second edition that covers System 7.5 is in the works.

System 7.5 provides some efficiency features I haven't mentioned (see "System 7.5 Efficiency Tricks"). Whether you switch to 7.5 or stay with 7.0, learn these techniques; you'll reduce the time you spend in the Finder and save more time for doing your work—or for doing something better yet. ■

Next Month: Headache-free Software Upgrading

Contributing editor JIM HEID is the author and producer of the third edition of *Macworld Complete Mac Handbook Plus Interactive CD* (1994, IDG Books Worldwide).

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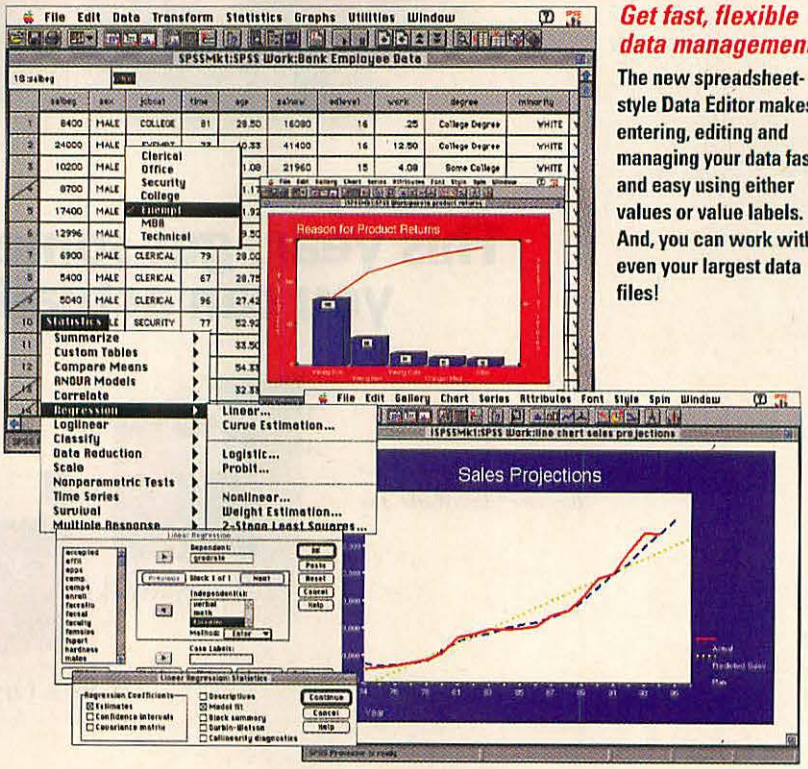

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Quick Tips

Tips, Tricks, and Shortcuts

DEDICATING AN ORDINARY MAC TO System 7's file sharing turns the computer into a simple, inexpensive file server for a small workgroup. Folders or entire hard drives on this file-server Mac can be made available to different network users, who in turn can back up important files of their own to the file server.

The problem with a homemade file server is its performance, notes Sam Jennings of San Francisco. System 7's file sharing assumes somebody will use the file-server Mac for more than sharing files, and it reserves about 50 percent of the file-server Mac's processing power for the nominal user—who in this case doesn't exist—to run applications. A utility called Nok Nok 2.0 from the AG Group (510/937-7900), which sells for less than $50, can adjust the amount of processing power reserved for file sharing, greatly improving file-sharing performance. Apple's AppleShare Server 4.0 software also allocates most of the computer's processing power to file sharing, but it costs about $1000. It does more than just optimize file-sharing speed, but for many situations you don't need more.

System 7.5 Size

Q. How in the world can System 7.5 take up so much RAM? Why does the RAM demand for 7.5 grow from 8MB or so on 680X0 Macs to a whopping 16MB on Power Macs? I consider 16MB barely adequate on my 660AV; if I upgrade to a Power Mac 6100, how much more RAM would I need merely to maintain current capability?

Lane Millet
America Online

A. The amount of RAM and disk space that System 7.5 requires depends on which parts of it you install, as tabulated in "System 7.5 RAM and Disk Usage." If you install the System 7.5 core module using the Installer's Easy Install option, you may get features you don't need. You can use the Installer's Custom Install option to select just the ones you need, or you can use the Easy Install option and then use the Custom Remove option to remove those you don't need. The System 7.5 core module uses 700K to 1MB more RAM and about 8.4MB more disk space than System 7.1. The PowerTalk and QuickDraw GX modules together use an additional 1.4MB to 2.2MB of RAM and 7.1MB to 8.6MB of disk space but are entirely optional (unless you use software that requires them).

DON BAKER

PowerPC programs—native Power Mac portions of System 7.5 and native Power Mac applications—contain more instructions and therefore take more RAM and disk space than equivalent 680X0 programs. PowerPC programs have more instructions because each instruction does less than the most frequently used 680X0 instructions. Like all RISC (reduced instruction set computer) CPUs, the PowerPC can execute its simple instructions much faster than a CISC (complex instruction set computer) CPU—such as a 68040—can execute its compound instructions. Thus a PowerPC program's larger size is a by-product of its faster performance.

The amount of additional RAM and disk space you need for native Power Mac software varies from program to program. You might get by with no increase in RAM, but more likely you'll want 50 to 100 percent more. Since you use 16MB on a 660AV, I recommend 40MB on a 6100 if you can possibly afford it. While 24MB may be enough right now, you're likely to want more RAM in the future, at which point you'd have to dump the two 8MB SIMMs in order to install two 16MB's. (You must install a pair of same-size, same-speed SIMMs in a Power Mac 6100's two memory-expansion slots. Similarly, you must install SIMM pairs in a 7100's four slots or an 8100's eight slots. All of today's Power Macs come with 8MB of RAM soldered to the system board.)

Color Patterns Gone

Q. I found some interesting extras in the book *Totally Rad Programs for the Mac* and added them to my IIsi at home and an LC II that I use in my classes. I also downloaded a picture taken by the Hubble Space Telescope and used the picture as a start-up screen. When I tired of the exploding-star start-up screen and tried to go back to the regular start-up screen, all the color desktop patterns dis-

continues

appeared from my General Controls control panel. The colors for all other programs are fine. I'm using System 7 on both machines.

Rod Powell
Syracuse, Nebraska

A. You can fix your problem (and many other problems) by doing a clean install of the system software. Possibly one of the extras you installed from the book removed, replaced, or damaged the regular desktop patterns, which are kept in the System file. A clean install of the system software will restore the missing color desktop patterns. (Don't bother zapping the parameter RAM or throwing away the Finder Preferences file, which store some control-panel settings. Neither of them contain the desktop pattern setting or options.)

To do a clean install, drag the System file from the System Folder to another folder (such as the Startup Items Folder) and change the name of the System Folder. Unable to find an existing System Folder, the System 7 Installer will create a new one with a clean copy of the system software. If you are installing System 7.5, you can easily do a clean install by pressing ⌘-shift-K in the main window of the Installer. The Installer then gives you a choice of installing a new System Folder (and archiving the old one) or updating the existing System Folder.

Eventually you will need to move preference files from the Preferences folder inside your old, renamed System Folder to the new one. You will also need to move items you added to the Extensions, Control Panels, Fonts, and Apple Menu Items folders in the old System Folder. In addition, look for items in the old System Folder itself that need to be moved to the new System Folder, such as an Aldus folder or a Claris folder. I suggest you move items from the old System Folder a few at a time, and test your system after each move. You may discover an old item that causes problems.

System 7.5 RAM and Disk Usage

	Power Mac 6100/60AV	680X0
Easy Install RAM Sizes		
System 7.5	3472K	2530K
PowerTalk	352K	585K
QuickDraw GX	982K	1678K
PowerTalk and QuickDraw GX	1456K	2248K
Easy Install Disk Sizes		
System 7.5	15.1MB	13.8MB
PowerTalk	2.4MB	2.4MB
QuickDraw GX	6.2MB	4.7MB
PowerTalk and QuickDraw GX	8.6MB	7.1MB
Major RAM Users		
Apple Menu Options	325K	42K
Macintosh Easy Open	296K	36K
QuickTime	262K	41K
Finder Scripting extension	177K	185K
CD-ROM software	87K	150K
PowerPC Finder Update	46K	not installed
AppleScript	42K	50K
WorldScript Power Adapter	40K	not installed
Major Disk Users		
Apple Guide and guide files	2628K	2220K
System	2559K	2559K
Control panels (Easy Install set)	1470K	1470K
Printer drivers except LaserWriter 8	1320K	1320K
Primary fonts and Palatino	1218K	1218K
LaserWriter 8	1140K	1140K
QuickTime	1709K	1063K
Apple Menu Items	751K	751K
AppleScript	706K	706K
Finder	451K	451K
Networking software	392K	392K
PC Exchange	366K	366K
CD-ROM software	308K	308K

To see how much RAM and disk space are used individually by System 7.5, PowerTalk, and QuickDraw GX, I measured the sizes just after installation and start-up on a Mac IIfx (with 20MB of RAM, virtual memory off, and a 500MB disk) and on a Power Mac 6100/60AV (40MB of RAM, virtual memory on and set at 60MB, and a 500MB disk). Your savings may not exactly match those listed here. System RAM usage depends on the amount of installed RAM and on the mix of installed extensions and control panels. Moreover, unless virtual memory is on you save very little RAM on a Power Mac by removing extensions. Disk space varies slightly depending on the capacity of the start-up disk.

Custom Floppy Icons

Q. I would like to know how to modify the icon resources in my System file so that any disk inserted into the floppy drive has a cool custom icon rather than the boring black-and-white icon that comes with the system. I used ResEdit to customize most of the regular icons (folder, Trash, alert, and so on), but my changes to the floppy icon don't have any effect. I would rather not use the system extension Cfloppy, which modifies the floppy disk icon, because my system takes up too much RAM as it is.

Todd Nguyen
Coralville, Iowa

A. Have you tried the free system extension Discolour by Andrew Welch (available from user groups and the Macworld forums on America Online and eWorld)? It gives all floppies a colorful, three-dimensional look and only increases system software memory size by 1K. You can't edit the floppy disk icons with ResEdit because the system software uses icons from the Mac's ROM.

Trackpad Cornering

TIP The trackpad on the PowerBook 500 is wonderful, but sometimes I find it difficult to get to a corner quickly (to use the Apple menu or switch to another open application, for example). You can fool the trackpad into quickly moving the pointer to a corner of the screen. Simply move your thumb or index finger a short distance in the direction of the corner you seek, and then tap the pad with the next finger, an inch or so from where your first finger was moving. The trackpad thinks one finger covered the distance between the fingers instantaneously, and it jumps the pointer directly to the corner.

Matt Taylor
Beverly, Massachusetts

Formatting Tick-Mark Labels

TIP After completing an experiment and tabulating the data, you turn to your Mac and ask ClarisWorks to graph it. Ah, but a problem arises! Although you measured the data precisely (to one and two decimal places), you don't want to clutter the chart axes with tick-mark labels that have decimal points with zeros after them. Unfortunately, ClarisWorks doesn't let you directly change the number format of tick-mark labels.

ClarisWorks copies the number format of tick-mark labels from the format of the first value it plots on each axis. So you could simply format the first cell of an axis's data the way you want the axis's tick-mark labels to appear. But this simple solution won't do the trick if you need the spreadsheet to show the full precision of your data.

A trickier technique is to insert dummy spreadsheet cells that change the number format of tick-mark labels without affecting the plotted data, as shown in "Chart Number Formats." First you insert a cell at the beginning of each range of cells plotted on your chart. In each inserted cell you enter a formula that gives the inserted cell the value of the next cell in the range (for example, **A2=A3**). Then you format the inserted cells as you want the tick-mark labels formatted. A chart that begins with the inserted cells will use them to establish the number format of the tick-mark labels.

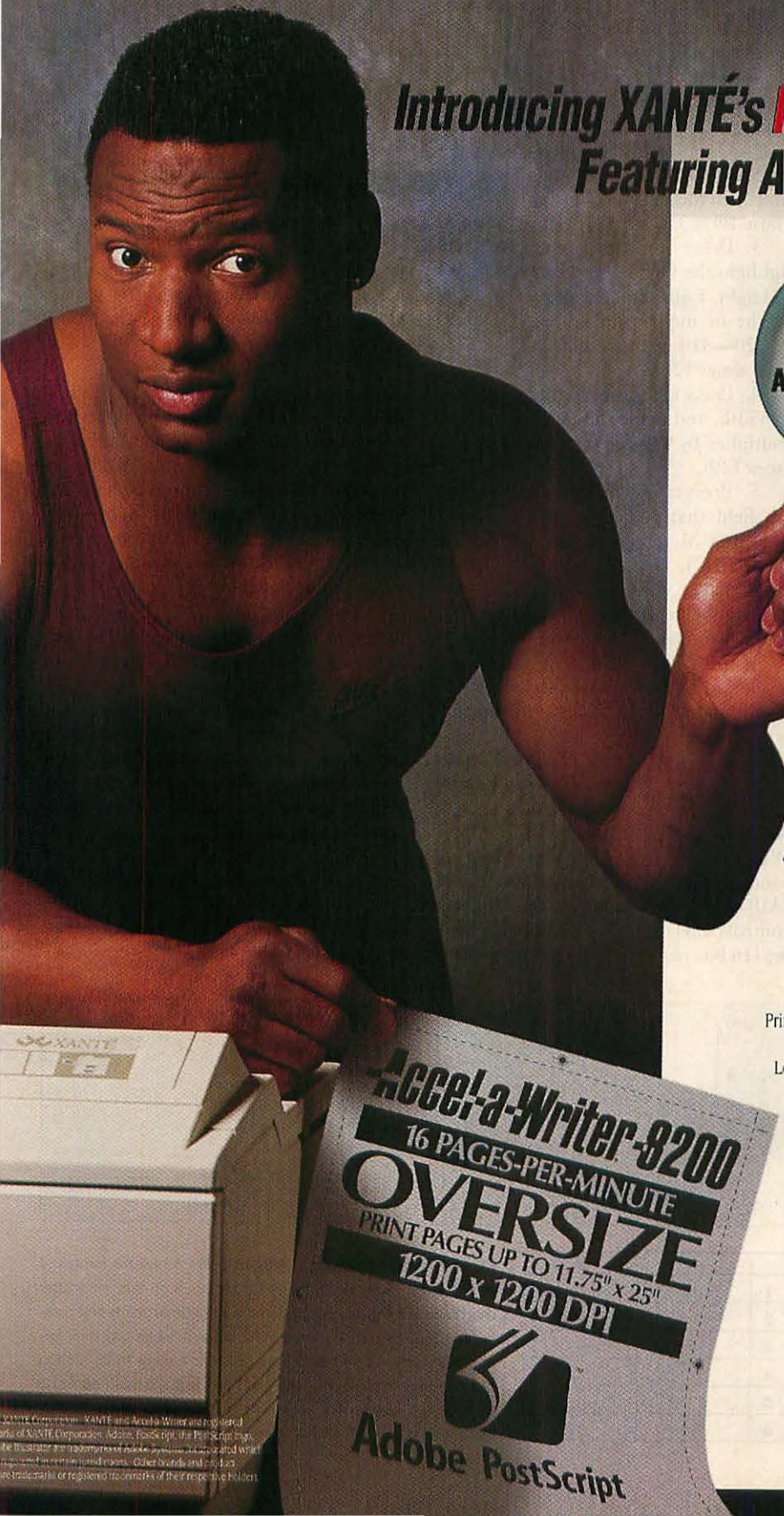
Dan Kuchera
Waterloo, Iowa

StyleWriter Paper Size

TIP To simplify printing on custom-size pages with a StyleWriter I or II printer, you can modify the StyleWriter II driver with ResEdit 2.1.1 or later. For example, the following steps describe

continues

Before You Invest in a High-Resolution Laser Printer, Take a Closer Look.



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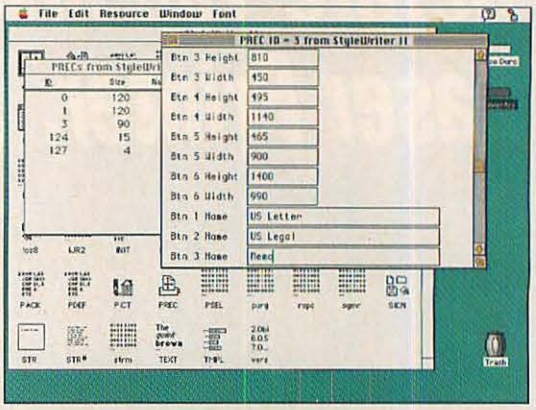
Circle 112 on reader service card.

how to change the StyleWriter II's Executive page size to the 6.75-by-3.75-inch page memo size that numerous personal organizers use.

1. Make sure you have a backup of the StyleWriter II driver. For example, drag the StyleWriter II icon onto the desktop and then option-drag it to the Extensions folder, making a copy there.

2. Use ResEdit to open the StyleWriter II copy, and then open the PREC resource whose ID is 3.

3. Press tab until you highlight the field labeled Btn 3 Height. Enter the new page height in inches multiplied by 120—810 in this example (6.75 times 120).



Custom Paper Size To customize the Page Size pop-up menu in the StyleWriter II's Page Setup command, use ResEdit to modify the StyleWriter II driver's PREC ID = 3 resource. Here, the height, width, and name of the third item in the pop-up have been changed to a 6.75-by-3.75-inch size named Memo. (Height and width are entered in 1/120 of an inch.)

4. Press tab again, highlighting Btn 3 Width, and enter the new page width multiplied by 120—450 in this case (3.75 times 120).

5. Press tab again until you highlight the field that is labeled Btn 3 Name, and enter Memo (as shown in "Custom Paper Size").

6. Save your changes and quit ResEdit. Make sure the edited StyleWriter II driver is in the Extensions folder.

If the edited StyleWriter II driver is selected in the Chooser, the Page Setup command lists the custom page size as an option.

Florin Neumann
Toronto, Ontario, Canada

AV VRAM Correction

While using the TV video-input or -output ports of a Quadra 840AV with 2MB of VRAM, you can set the Monitors control panel to display thousands of colors (16 bits per pixel) on a monitor whose resolution is 832 by 624 or less. Tyson Boucher of Oregon City, Oregon, noticed that last November's *Quick Tips* incorrectly stated you could display at most 256 colors under those conditions. With an NTSC monitor in flicker-free mode you can set Monitors to a maximum of 256 colors (8 bits per pixel), and live video is not available. ■

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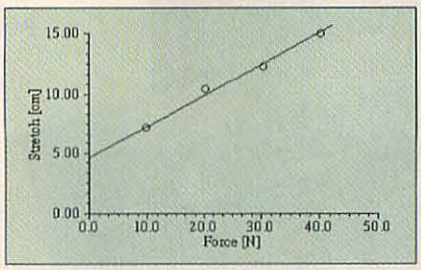
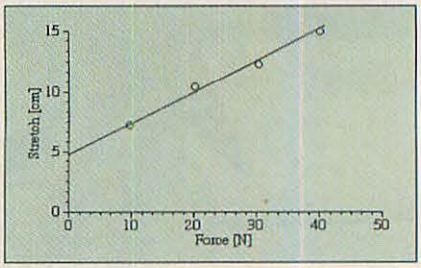
LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld System 7.5 Bible*, third edition (IDG Books Worldwide, 1994).





	A	B
1	Force [N]	Stretch [cm]
2	10	7
3	9.8	7.25
4	20.2	10.51
5	30.3	12.35
6	40.1	15.00

Chart Number Formats Although cells A3:B6 are formatted with decimal places (left), the tick-mark labels on the *x-y* scatter chart (above right) are not cluttered with decimal points and post-decimal zeros; this chart plots cells A2:B6, so its labels take their format from cells A2 and B2. Those cells don't seem to be plotted because their formulas (A2=A3 and B2=B3) make them duplicate other plotted values. The above left chart plots A3:B6, so its tick-mark labels take their format from A3 and B3.

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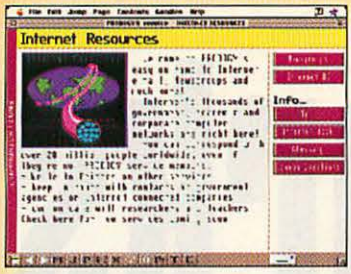

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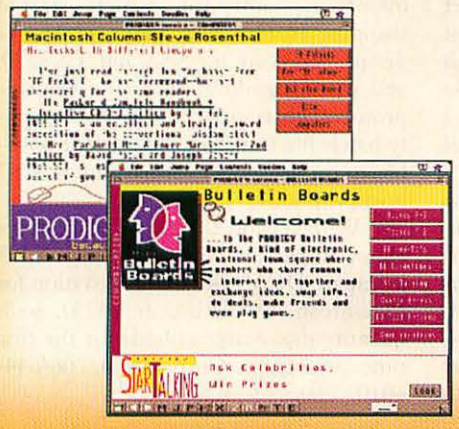

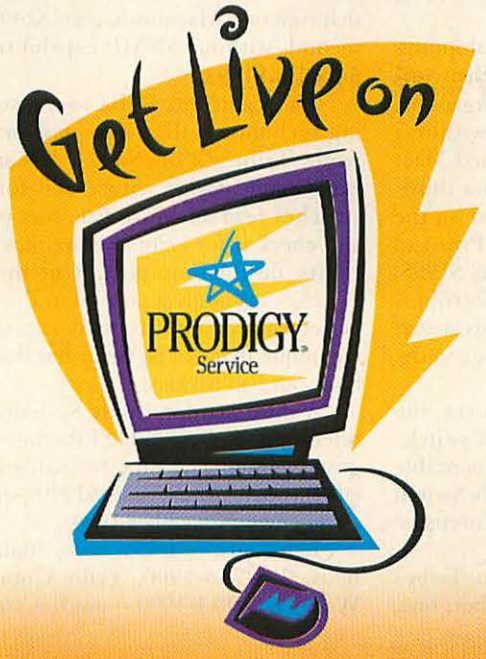

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Circle 75 on reader service card

EDITED BY ELIZABETH DOUGHERTY

Networks

THE LATEST IN CONNECTIVITY AND COMMUNICATIONS

Why Switch?

SINGING THE BANDWIDTH BLUES? Switches may be just what you need to get your Ethernet network humming again. However, only a handful of vendors have designed Ethernet switches specifically for Macintosh workgroups. Two of the most recent entrants in this market are Lantronix and Tribe Computer Works.

Rather than just repeating the signal the way a hub does, an Ethernet switch divides a large, busy network into smaller segments or workgroups. Because it isolates traffic to within individual workgroups, a switch reduces the traffic flooding the entire network.

Without a switch, all the users on a network share a single 10-Mbps pipe; with a switch, each workgroup enjoys its own dedicated 10 Mbps.

That kind of extra bandwidth is especially welcome to users in a Macintosh environment, where heavy peer-to-peer traffic from System 7 file-sharing can bog down a network's throughput.

Lantronix recently started shipping its LSB4, a RISC-based switch that connects up to four Ethernet workgroups. The LSB4 can be managed within a workgroup from a locally attached Macintosh or PC, or centrally from a third-party management system based on the Simple Network Management Protocol (SNMP). The 4-port LSB4 costs $1995. To accommodate larger workgroups, Lantronix expects to ship an 8-port switch in December and a 16-port version in the first quarter of 1995.

From Tribe Computer Works, the maker of two popular LocalTalk switches, comes a new 5-port rack-mountable Ethernet switch called the TribeSwitch EN, also targeted at traffic-intensive Macintosh workgroups.

Tribe expects to ship two TribeSwitch EN versions in November: one, with SNMP-based management software that runs on a Macintosh, costs $2495; the second, without SNMP capabilities, is priced at $1995.

The Lantronix LSB4 uses a switching technique called *store-and-forward*, while Tribe's TribeSwitch EN uses a *cut-through* design. Store-and-forward switches read an entire Ethernet packet and check it for errors before moving it to its destination port. Cut-through switches read only a portion of the packet before sending it to its destination, a technique that can be faster but does not filter out bad packets.

A third vendor, Sonic Systems, also offers a Mac-manageable Ethernet workgroup switch. The EtherSwitch, a 5-port cut-through switch, costs $2499 (see *Networks* news, November 1994).

Lantronix, 714/453-3990; Sonic Systems, 408/736-1900; Tribe Computer Works, 510/814-3900.—MARTHA STRIZICH

JEFFREY PELO

Attachmate Cuts Mac-to-Host Cost

ATTACHMATE'S EXTRA FOR MACintosh 2.0 costs less than its predecessor. The new version of this Mac-to-mainframe software, which started shipping in October, supports AppleScript, NetWare for SAA and TN3270, and corresponding FTP (file-transfer protocol) file transfers. New tools simplify batch-file transfers and make it possible to do on-screen formatting of 3287 host print jobs.

With version 2.0, the list price drops about 30 percent to a competitive $295 (compare DCA's IRMA Workstation for Macintosh 4.0 listing at $425), with quantity discounts available for the first time. Attachmate Corporation, 206/644-4010.—NANCY E. DUNN

Cayman Regroups

REMOTE ACCESS. CROSS PLATFORM. Multiprotocol. Talk to Cayman's CEO, Brad Noblet, and you'll hear the same themes that rival Shiva's CEO, Dan Schwinn, so succinctly sounded several years ago when Apple (then AppleTalk) Remote Access debuted and both router companies unveiled ARA servers. Since then Shiva has captured a large share of the remote-access server market. Cayman, known for its AppleTalk tunneling technology, has been less visible, while recently laying off a third of its workforce and recharting its course.

Noblet says Cayman will continue to leverage its routing, remote access, and Macintosh expertise; however, it will devote more development resources to Windows and DOS—roughly splitting its engineering staff between Macintosh and PC projects. It's also focusing on IPX and TCP/IP development. In further efforts to reach beyond its AppleTalk roots, Cayman is working on WAN protocols such as frame relay, ISDN, and SMDS and will make product announcements early in 1995, according to Tom Pincince, Cayman's vice president of engineering and product marketing.

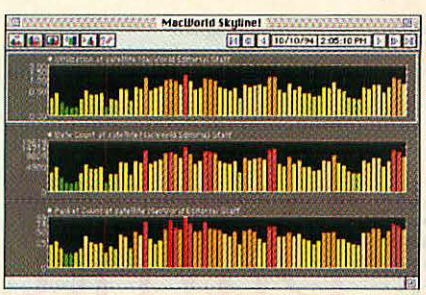
In continuing to support its Macintosh product lines, Cayman expects to release software upgrades for its GatorRoute iR router, GatorStar iHR hub/router, and the GatorAccess MP remote-access server in the first quarter of 1995. The GatorRoute iR and the GatorStar iHR, which currently tunnel AppleTalk and IPX, will run these protocols over PPP, in addition to supporting TCP/IP. An upgrade will cost $199. The Gator AccessMP, which currently supports TCP/IP and IPX, will support AppleTalk running over PPP. The upgrade will cost $495. Cayman, 617/932-1100.—E.D.

A Bird's-eye View

THE AG GROUP WILL FINALLY DELIVER its Skyline software (first announced two years ago) for saving and analyzing Ethernet network-traffic patterns.

Skyline consists of two parts, which communicate via Apple events: a graphical display console (called Skyline) running on a dedicated Mac, and data-collection software (called a Satellite) running on a Macintosh, with a dedicated Ethernet card, residing on each remote network segment. Skyline/Satellite, sold in either a 680X0 or a Power Mac version, costs $795 for one monitor and one remote agent; an additional five remote agents cost $1195. The Ethernet software is scheduled to ship in November. Later versions will support LocalTalk and Token Ring.

Skyline constantly gathers time-indexed traffic data, providing network managers with baseline network data as well as information for troubleshooting. It can send alerts if thresholds are exceeded. Data collected includes all Ethernet traffic and most protocol information. For example, when two network nodes communicate, Skyline tracks source and destination addresses, protocol type, and errors. AG Group, 510/937-7900.—E.D.



The AG Group's Skyline software displays network statistics in real time. These graphs show utilization, packet counts, and byte counts at a remote segment.

ISDN Modems

NOW THAT MORE COMPANIES—and even well-connected individuals—are opting for ISDN (Integrated Services Digital Network) phone service, digital modems designed for ISDN communications are showing up.

AccessWorks Communications is shipping two models of its QuickAccess ISDN digital modem. Both come with an NT1 port and built-in asynchronous-to-synchronous PPP software conversion. The QuickAccess Remote model ($499) has one 115.2-Kbps data port. The QuickAccess Gateway model ($979) boasts two 115.2-Kbps data ports. If attached to a file server or communications server, a QuickAccess modem can be shared over a network.

TOM GIBSON

AccessWorks' QuickAccess Remote, an ISDN digital modem that costs less than $500, has one 115.2-Kbps data port.

Due by the end of 1994, Motorola's Hybrid Modem TA 200 (expected street price $700 to $900) will handle ISDN along with conventional analog 14.4-Kbps V.32bis data and fax communications. When dialing out, users will select which kind of transmission, but the modem will automatically select the correct mode for incoming calls. The HMTA has NT1 built in; it operates as fast as 115.6 Kbps for asynchronous sessions and 64 Kbps for synchronous sessions. AccessWorks Communications, 908/888-4570; Motorola, 205/430-8000.—NANCY E. DUNN

X Window for Mac Catches Up

SPEEDY POWER MACS AND native versions of X server software now make the Mac a good alternative to a dedicated X Window terminal for users who need access to applications on a host computer. Accordingly, White Pine Software, the maker of the highly regarded eXodus line of X Window server software, has licensed its X server software to The Wollongong Group, which will market it as PathWay X Server. The licensed software is based on the Power Mac version of eXodus, which supports version 11 release 5 of the X Window System standard. PathWay X Server is scheduled to ship in December.

Tenon Intersystems also has begun shipping a Power Mac version of its X Software 3.0 ($350) for Macintosh and Power Mac, which runs on top of Tenon's MachTen Unix operating system for the Mac ($495 or $695). Tenon says X Software 3.0 gives SPARC-class performance on a Mac Centris 650.

Last summer Apple Computer and AGE Logic announced plans to work together to produce X server software for the Mac. Apple expects the first fruits of the collaboration—AGE's X server; XoftWare for Mac; and an upgrade to Apple's X server, MacX—to ship early in 1995 (prices not set).

AGE Logic, 619/455-8600; Apple Computer, 408/996-1010; Tenon Intersystems, 805/963-6983; White Pine Software, 603/886-9050; Wollongong Group, 415/962-7100.—NANCY E. DUNN

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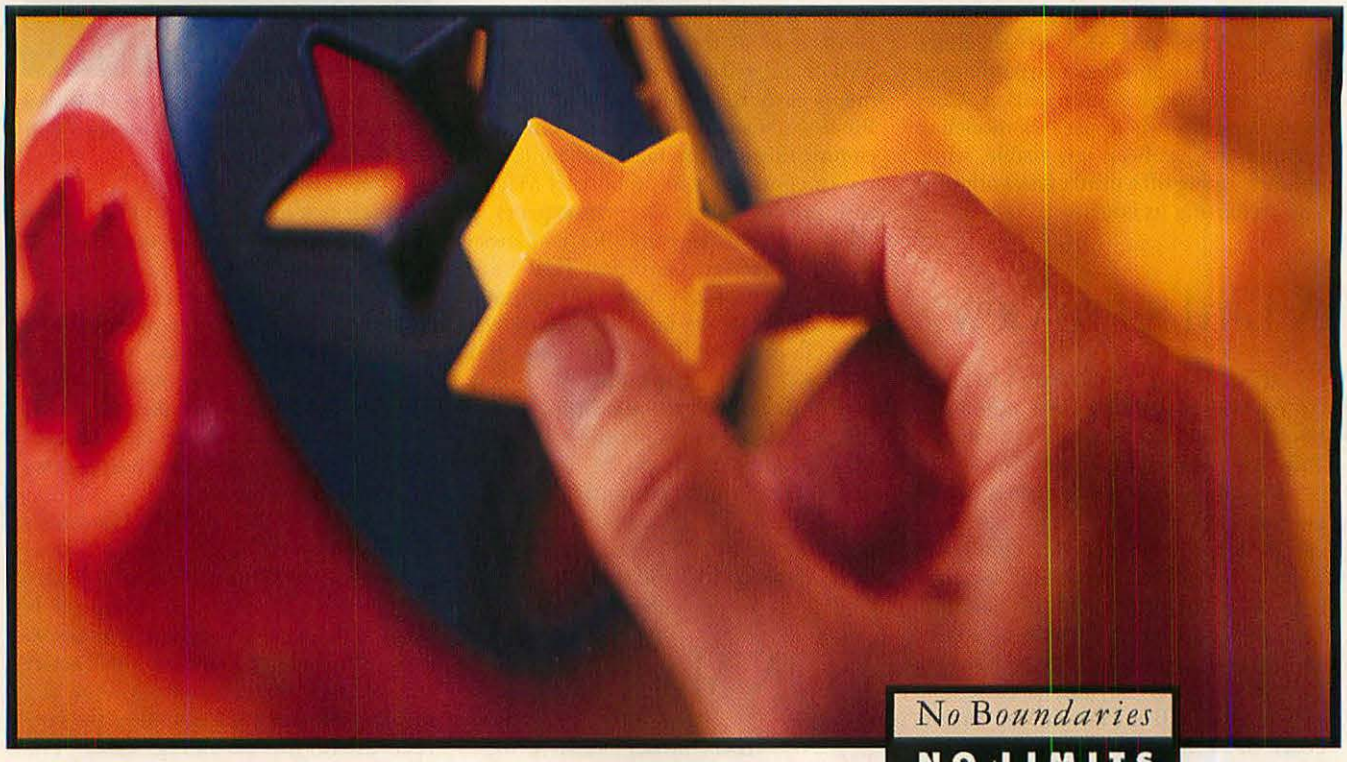

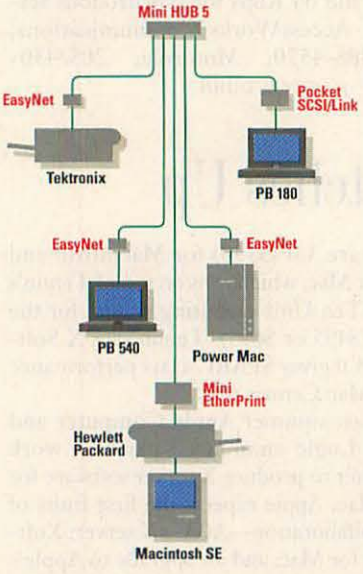

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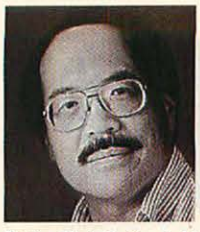

BY CARY LU

PowerBook Notes

Wide-Area Wireless

LAST MONTH I LOOKED AT PREMISES wireless—radio and infrared links that work within a room or a building. This month I take up wide-area wireless communications that operate across a city or across the country. Today four very different kinds of wide-area wireless data services are in operation or pilot testing.

Data over Analog Cellular

The most familiar route to wireless data is over AMPS (Analog Mobile Phone System), the standard analog cellular phone system. You can use a conventional (wireline) modem; instead of a phone jack, you connect the modem to a cellular phone with a data jack through an interface box such as the $249.95 Cellular/Data Link from ORA Electronics (818/772-2700). The ORA box works with specific Mitsubishi, Motorola, NEC, Oki, and Panasonic cellular phones; if you switch between different phone types, you'll need a $69 adapter cable. Some phone vendors, such as Motorola, sell interface boxes for their own phones.

Most wireline modems have no special provisions for cellular telephone calls and either work slowly or not at all, running as an ordinary V.32 modem. You should connect while stationary and avoid peak call times—such as late afternoons—when the signal quality degrades. For best results with cellular calls, Motorola engineers suggest reconfiguring your modem:

- Make sure the software runs standard V.42 error correction.
- Set register S7—how long the modem will wait for a carrier tone during call setup—to 90 seconds (the default is usually 50 seconds) because cellular calls can take a long time to connect.
- Set register S10—how long the modem will overlook a loss of the carrier signal—to 5 seconds or more (default is usually 1.4 seconds) so the modem won't drop the call during a handoff from one cell site to another, which may occur even when you aren't moving.

- Lower the transmit level. Cellular phones make conversations as loud as possible to overcome noise, which clips (distorts) modem signals. Some modems support leased-line operation with an &L1 command that cuts the transmit level by 3 decibels (the modem will still work on dial-up calls with the leased-line setting, which is intended for a special kind of phone line). Many modems lack any transmit-level control.

Even after you adjust the modem, a cellular connection may not work well because the modem and cellular phone cannot work together optimally through a simple RJ-11 cable; a throughput of 200 to 300 characters per second (cps) is typical. (I use *cps* rather than *bits per second*, or *bps*, to emphasize throughput, which is often much slower than the apparent connection speed.) Two modem-and–cellular-phone combinations have been designed to handle data. The $1595 AirCommunicator from Air Communications (408/749-9883, 800/247-3282) is a rather large cellular phone with a built-in modem. The size allows for modem circuitry and a battery for two-hour talk time. Motorola UDS (205/430-8000, 800/451-2369) offers external and PCMCIA modems specifically designed to work with its Flip Phones. The AirCommunicator and Motorola products are designed to increase speed and reduce the error rate by controlling the signal levels and closely monitoring the data exchange. Both products can work effectively, but their performance necessarily varies with conditions. (Each can operate as a wireline modem as well.)

A few modems go a step further by incorporating a special cellular error-correction protocol designed for radio communication. AT&T ETC (Enhanced Throughput Cellular) provides throughput typically in the 700-to-1100-cps range, generally 20 to 30 percent faster than the older Microcom MNP-10 protocol. The rarely found ZyCellular protocol outperforms ETC in several tests. Naturally, all these protocols are incompatible. Both sending and receiving modems must use the same protocol; otherwise the modems will revert to V.42 operation or even basic V.32 without error correction. Very few receiving modems have cellular protocols.

There is a way around this problem. Some cellular services have installed modem pools in their cellular network.

continues

PHOTOGRAPH BY PAUL FRANZ-MOORE/SCREEN IMAGE BY JIM LUDTKE

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When you dial data calls with a *DATA (*3282) prefix, the cellular system directs your call to a modem in its pool. This modem acts as an intermediary; it presents your portable modem with a cellular protocol and presents the wireline modem you're calling with a standard V.42 protocol. Primary Access Corporation, the main supplier of modem pool software, supports ETC and MNP-10. Some cellular providers charge for access to the modem pool. Even if you aren't using a cellular protocol, you may get faster throughput by using the modem pool, whose wired connections are designed for data; the rest of the cellular network is optimized for voice.

The Primary Access modem pools also support TX-CEL, a modem-enhancement process from Celeritas Technologies that works in conjunction with a cellular protocol or with plain V.42. Only a few modems have TX-CEL installed.

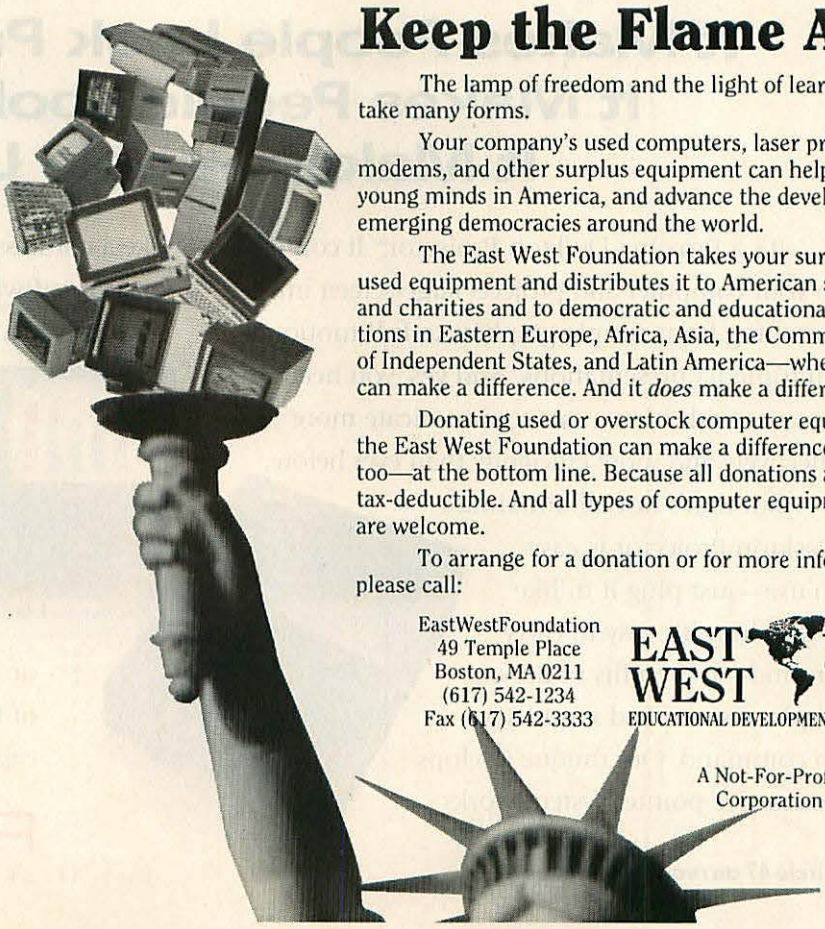
Most cellular providers will eventually install modem pools; for now you may need to switch cellular services in some areas. A few Public Data Network companies—which provide connection facilities for online services—have installed modems with a cellular protocol.

Most modems sold for portable computers lack a cellular protocol, but more are adding the feature. The $199 Spectracom 1414iPB with MNP-10 from Bay Connection (408/270-8070) is one of the few that fits inside a PowerBook (100 series only). Microcom (617/551-1000, 800/822-8224) and Racal-Datacom (305/846-4811, 800/722-2555) offer modems with MNP-10; AT&T Paradyne (813/530-2000, 800/482-3333) and Sierra Wireless (see discussion of Cellular Digital Packet Data below) offer modems with ETC. Most of these companies sell both external portable and desktop modems; many have or plan PCMCIA versions that may be compatible with 500-series PowerBooks.

Cellular calls cost 25 to 75 cents a minute, plus roaming fees if you're outside your normal service area. A megabyte of data costs $5 to $25 to transfer, compared with less than a dollar or even nothing for a local wireline data call. (Long-distance and online charges, if any, are not included in my cost estimates.) You pay as long as you are connected, whether or not you are actually sending or receiving data. Many users prepare their work in advance, connect for the minimum time possible, and get off. Analog cellular can work effectively as an adjunct to the wireline modem on your office computer since you can connect to the same services as you travel and you need only one mail-

continues

You think she's finishing the proposal. She thinks you are. Surprise, neither one of you are. And it's 4 hours before the grant committee meets. Let's see, 16 new pages of data, 11 article reviews, 3,600 words sent by your partners in Istanbul. Who can type faster? Aaargh! What now?



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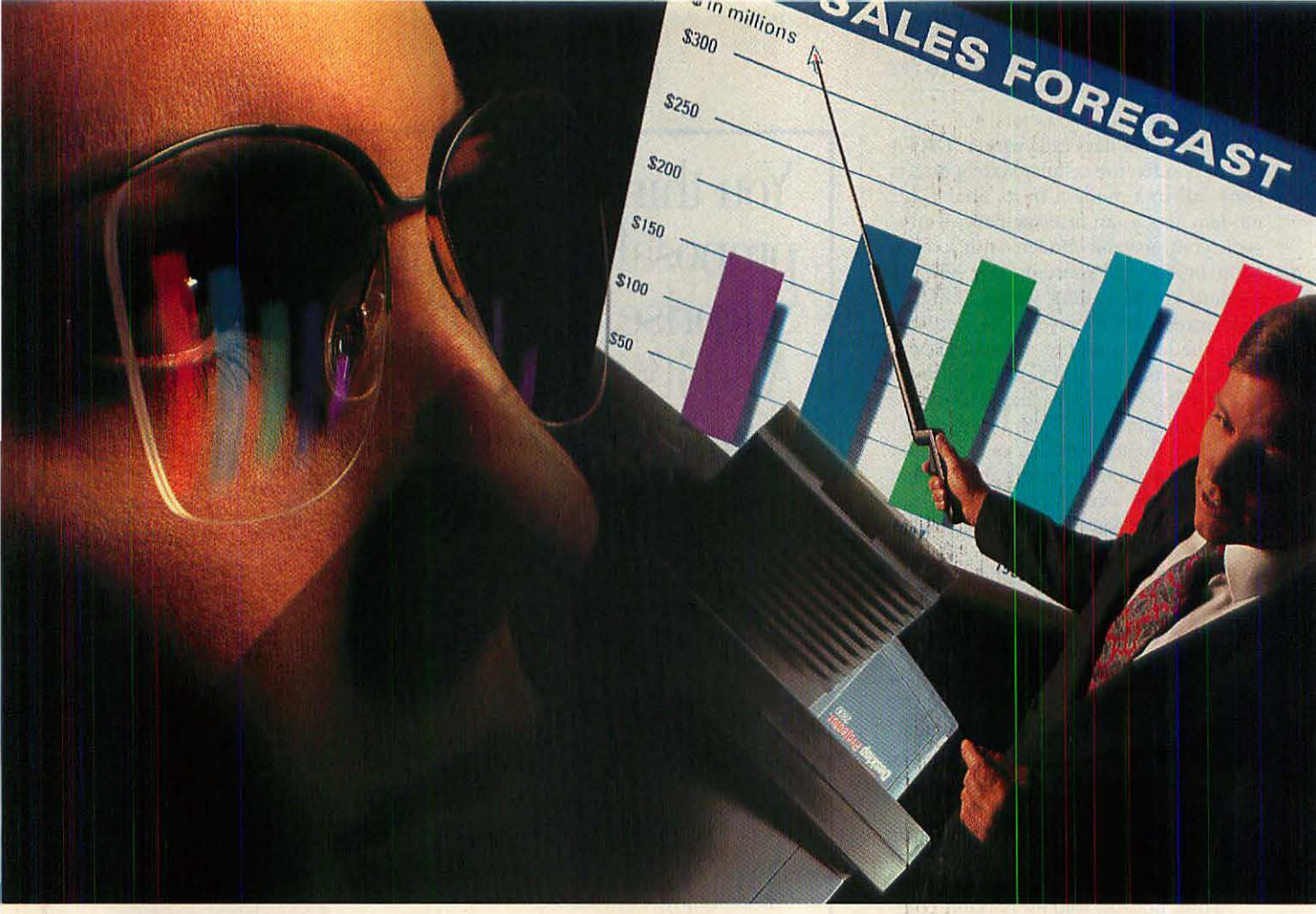

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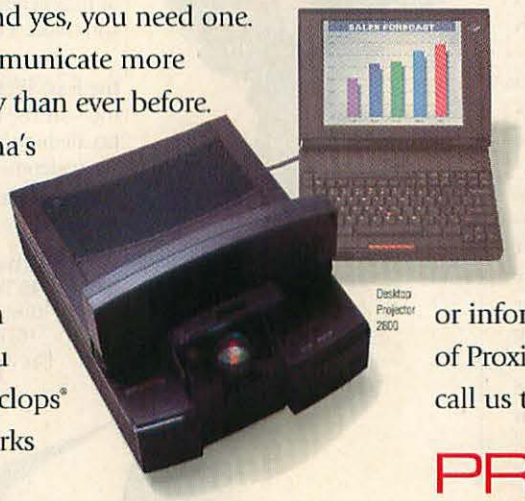

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box. You can usually check a mailbox in a minute or two, but you have no idea when a message is pending unless you dial in, a major limitation of all dial-up systems.

Packet Radio

Unlike AMPS (the only major wireless service that charges by the minute), most services break data down into packets and charge by the packet. Since you are charged only for the packets of data you send and receive, there is no cost penalty for staying connected for hours at a time. Thus you can read and write your E-mail without disconnecting. While connected, you get your mail immediately. The radio modems for the packet systems are a bit smaller than a cordless phone and weigh about 12 ounces; for travel, add another pound for the AC adapter/charger.

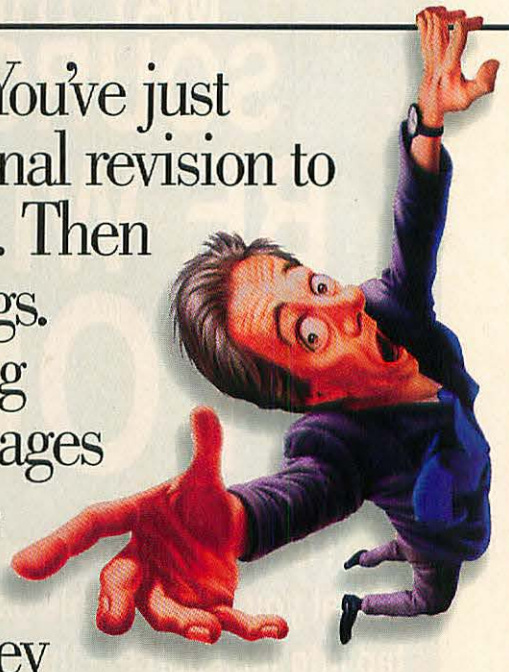
RadioMail (415/286-7800, 800/597-6245) operates an E-mail system that uses RAM Mobile Data or Ardis, two wireless services in the 900MHz band that are available to 90 percent of the U.S. population. To use one of the services, you attach an external packet radio modem ($400 to $800) to your PowerBook's serial port and run the E-mail program Eudora. The typical throughput is 300 cps to 600 cps. With RadioMail, you have an Internet address for mail but no other Internet access; you cannot connect to any online services. You can send faxes—plain text only—through a gateway. You can exchange files with Internet addresses that can handle the BINHEX format, which is easy if your correspondent also uses Eudora or a similar program but clumsy if your correspondent must process a BINHEX file manually. The maximum message size is 10K (you can request a maximum of 64K). Longer files will be truncated; thus you must segment them before going to RadioMail.

The system is mainly designed for short text messages. After a setup fee of $99, RadioMail charges $89 a month for unlimited messages over RAM Mobile Data. Over Ardis, RadioMail bases the charge on message units of 238 characters each; $59 a month includes 200 message units, and each additional message unit costs another 28 cents, so a megabyte costs $1233 to send.

The new WyndMail network (805/547-6460, 800/549-6000) also uses RAM Mobile Data and the same portable modem as RadioMail. Wynd charges $49 (50K) to $139 (unlimited) a month and promises integration with paging and voice mail. Wynd's well-designed software does not truncate long messages or files. WyndMail was scheduled for commercial operation by the end of 1994.

continues

It's 3:50 pm. You've just finished the final revision to the sales plan. Then the phone rings. "We're sending over 10 new pages of competitive info." Click. Good thing they lock the windows on this floor. You have to get it into the plan by the end of the day. What now?



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Cellular Digital Packet Data

The third class of wireless service, Cellular Digital Packet Data (CDPD) operates in the cellular phone band but works very differently from a dial-up cellular call. Instead of maintaining a continuous carrier like a wireline or AMPS modem, a CDPD modem sends and receives only when necessary, piggybacking all the data on the existing cellular phone system by using the quiet time between ordinary cellular calls (it does not use silent periods within a call). CDPD hops from one channel to another automatically. When you establish a CDPD link, your modem registers itself with the nearest cellular transmitter. Every minute or two, the transmitter broadcasts a list of modems it has messages for; modems that have no pending messages can save power by going into sleep mode (like a PowerBook) until the next broadcast. Therefore, a CDPD modem appears to be connected continuously even though it is asleep most of the time. The peak nominal transmission speed is 19.2 Kbps; current tests suggest that the data throughput is about 800 cps in typical usage.

A CDPD link connects your computer to a TCP/IP network via the Internet. You can browse the Internet and retrieve your own files if your company has an Internet gateway to its computers. CDPD should be available in most areas by late 1995 or early 1996.

As with packet radio, CDPD pricing encourages short messages. Bell Atlantic charges $24 a month for six 750-character messages a day. Depending on the carrier, a 1MB file transfer costs $85 to $170. Many users may prefer CDPD for interactive messaging but switch to an AMPS connection for long files.

The $1195 PocketPlus from Sierra Wireless (604/231-1100) combines three types of modem: CDPD, AMPS with ETC, and wireline. Although it lacks a voice phone, the PocketPlus is the most complete data-communication package for PowerBook users to date.

Metricom's Ricochet

If you find the pricing for wireless services too high, consider the dark horse: the Ricochet packet radio system from Metricom (408/399-8200, 800/556-6123). Operating with spread-spectrum radio modems in the 902MHz to 928MHz frequency band, Metricom promises high speed at a low cost. After a $95 activation fee, unlimited use at 9600 bps costs $9.95 per month, 19.2 Kbps costs $29.95 per month, and unrestricted speed costs $29.95 a month. The modem sells for $495 and supports nominal speeds from 2400 bps to 115.2 Kbps; Metricom says

the maximum throughput is typically 2000 to 3000 cps. The connection can be to another computer with a Ricochet modem (in which case the data does not pass through Metricom's network), to a corporate network, to the Internet via gateways ($15 per month), and to dial-up online services through Metricom's modems ($5 per month). Typical monthly bills should run $30 to $40 for unlimited service. Just how well Ricochet will work over larger areas with many users and in the presence of other radio traffic in its unlicensed band remains to be seen. Metricom's plans to introduce service in major cities by the end of 1995 will nevertheless provide much less geographic coverage than the competing services.

Other Wireless Options

If you just need to send or receive a very short message such as a phone number, a pager is the least expensive alternative; many pager services can be reached by modem with software such as AlphaPage ($89) from Information Radio Technology (216/531-1313).

Other digital services are in the offing. The digital voice calls that the cellular providers are now promoting cannot be used for data because the coding methods are designed exclusively for voice. In the future—at least several years away—a dial-up digital service for data over cellular frequencies could operate at fairly high speeds. Recently the FCC has reassigned and auctioned several other frequency bands that could provide data service.

Since most wireless users will also have a wired connection—either through a corporate network or a wireline modem—they'll have to cope with multiple mail addresses and hassle with forwarding messages. A truly integrated system would consolidate all E-mail, pager, fax, and voice-mail messages through a single mailbox. You could retrieve all messages with any available device—computer, pager, fax machine, or voice telephone. For example, if you called in by telephone, you could listen to your E-mail messages. Such consolidation is a long way off, although WyndMail is taking the first steps.

In all the confusion, one thing remains clear: Though sometimes cumbersome, cables will always provide a simpler, faster, and cheaper connection. Wireless will remain an option for people who are willing to spend money—sometimes lots of it—for convenience. m

CARY LU is a *Macworld* contributing editor who covers mobile- and remote-computing issues in this monthly column. He can be reached at carylu@eworld.com.

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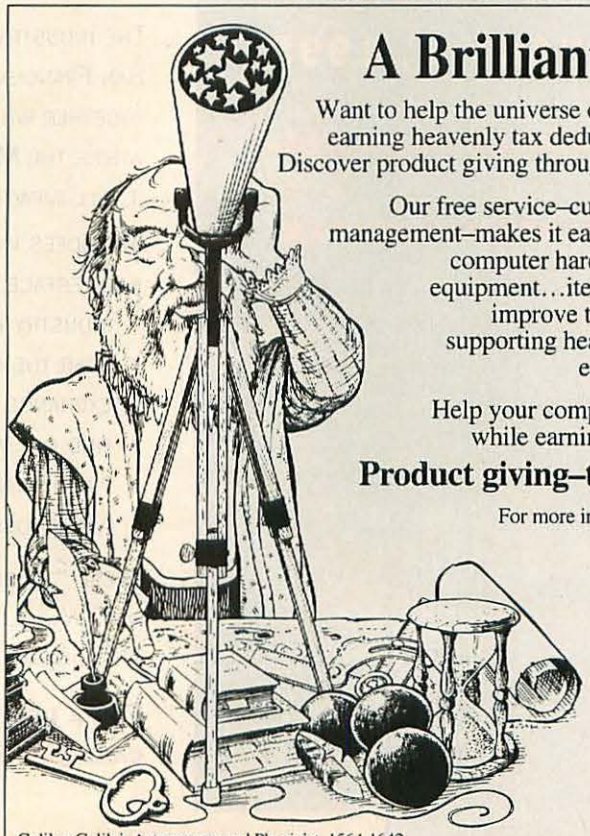

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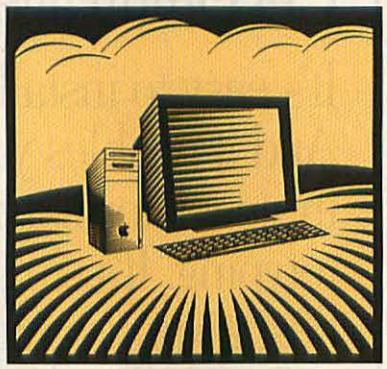

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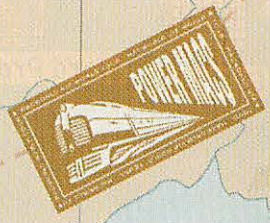

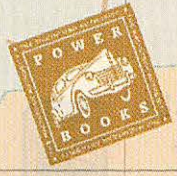

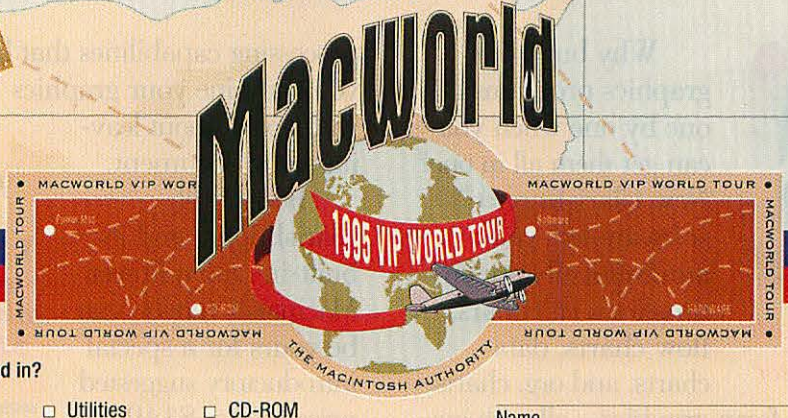

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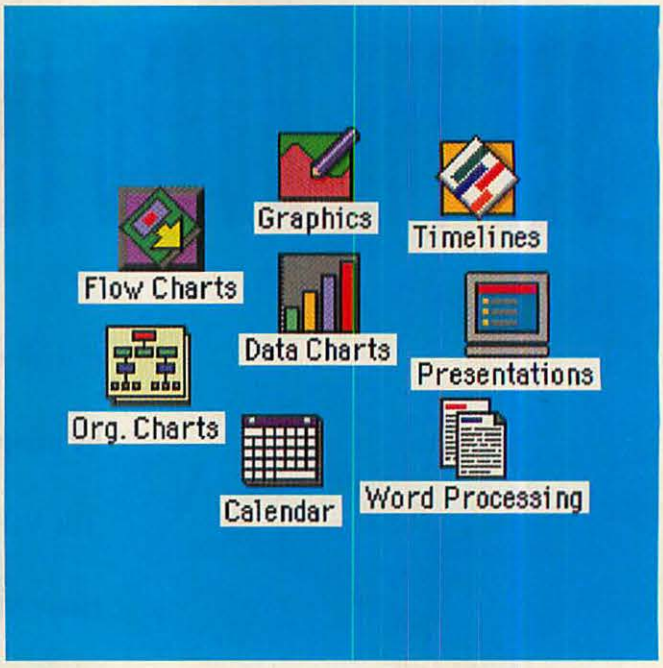

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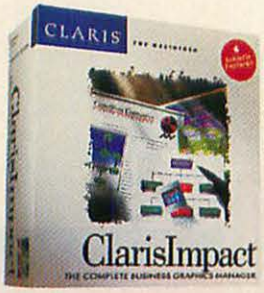

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THE DESKTOP CRITIC

BY DAVID POGUE

CPU → TV/VCR

Getting the Mac's picture on TV for under $500

THERE'S ONLY ONE WAY TO protest the mindless junk on TV these days, and that's to replace it with some mindless junk of your own. Any homemade QuickTime flick or Adobe Photoshop file is certainly more deserving to be on the boob tube than this season's network crud. Heck, I can even think of a spreadsheet or two I'd rather watch.

Getting the Mac's picture on TV is an even more tantalizing prospect if you make Mac-based presentations. When your audience is too big to crowd around a PowerBook but too small to merit a pricey projector (see "Portable Presenters," in this issue), a TV set is the perfect visual aid.

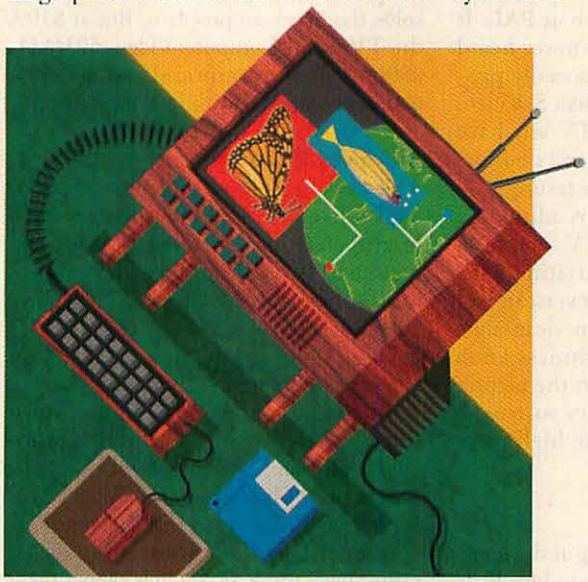
Alas, when it comes to the Mac, television has, shall we say, an image problem. Several problems, really. For example, the picture on a TV is created by two rapidly alternating sets of scan lines; a Mac screen is painted in one continuous pass. As a result, whenever the Mac displays horizontal lines on a TV screen, they flicker and jitter like they're being electrocuted. Unfortunately, the Mac interface is literally littered with lines, such as the stripes in a window's title bar. Another dilemma: to ensure that you get a full edge-to-edge viewing experience, a TV's electron gun is deliberately designed to *overscan* the glass screen (that is, to enlarge the picture so that the edges get clipped off). On a Mac, of course, lots of important stuff appears along those edges—your menu bar, for example.

Therefore, if you want to make TV-based presentations, or play video games on the family TV, or record your QuickTime movies onto the VCR, you have to buy a specialized converter box.

Good news: Mac-to-TV converters cost only a third what they did two years ago, and they produce a much better picture. Bad news: a TV is designed to be watched from across the room, not up close like a Mac monitor. No matter what converter you buy, you can't use a TV *as* a monitor; 12-point type is usually too indistinct to read.

There are more than 100 converter boxes and boards available for the Mac. Our price cutoff was $500. I discovered that these gadgets are amazingly alike. All are about the shape of a romance paperback. When hooked up, they all require wires trailing off to your Mac, TV, and wall outlet. Except as noted below, every box has a jack for a monitor, too, so you can have it and the TV working at the same time. Unfortunately, for some dumb reason, said jack accommodates only IBM-style monitors.

I tested six kinds of images: windows and menus; big, bold, colorful type, as in a Mac slide show; QuickTime movies; 24-bit Photoshop photos; typing in a word processor; and computer-generated fractal graphics. Note that each converter lets you connect two kinds of equipment: the composite type (normal TVs and VCRs) and the S-Video type (expensive TVs and VCRs, such as Hi-8 and S-VHS). The color and clarity of the S-Video jack were judged to be about 50 percent better than composite by a panel of visual-chrominance experts (OK, a few friends in my living room).



L-TV Portable

I admired this unit's compact, PowerBook-colored design, the plain-English instructions, and the DIP switches that adjust the picture's position and size on the screen. Unfortunately, right out of the box, the L-TV produced a dark and muddy picture ($229.99; Focus Enhancements, 617/938-8088).

That's when I discovered the importance of the brightness knob. Turning this tiny dial (with the included screwdriver) made a *huge* difference in picture quality. What had been drab and dark became bright and beautiful. That's how I learned that a brightness dial is one of the most important bells and whistles you can shop for—and I wound up admiring the L-TV all the more.

Note, by the way, that the L-TV comes with an optional system extension called Squeeze. It gives the Mac a slightly smaller desktop, nudging your icons and menu bar inward, to compensate for the overscan problem; it works great. Alas, Squeeze crashes System 7.5—even the updated version that Focus sent me upon request. (This is true of the similar software included with other converter boxes, too.) On the other hand, Focus does offer a toll-free help line. And get this: it is available seven days a week (and 12 hours each weekday). Whatever happened to that kind of service?

P.S.—At the last minute, I checked out the new L-TV Portable Pro ($299). The extra $70 gains you a full-fledged Mac monitor jack instead of the irrelevant IBM one. The Pro supposedly works with PAL (European) TV sets, too.

Mac DisplayLink

What a clever concept: design a converter box with a little compartment that houses its own cables! Unfortunately, the Mac DisplayLink is otherwise a disappointment (Display Tech, 510/676-9362). The manual writers need a Mac lesson or two—for starters, there's no

continues

restart key on the keyboard, folks.

But that's quibbling. The real problem is that the DisplayLink offers no anti-flicker feature except on certain Macs—the Quadra 700, 900, 950, and Macs for which you've purchased an Apple 8•24 video card—and then only in 256 colors. On all other Macs, images containing thin horizontal lines are simply unwatchable. For much less than this converter's $349 cost, you could buy a unit that works with *all* video-ready Mac models.

TV Converter Features

	L-TV Portable	MediNet Encoder	Mac DisplayLink	The Presenter Mac/PC	TelevEyes/ Plus	TV Gamer Plus	TV Scan
Brightness dial	●	●	○	○	●	●	○
Position controls	●	●	○	●	○	○	●
Overscan correction	●*, **	●**	○	●*	●**	○	●*

● = yes; ○ = no. * Has a switch that helps but doesn't solve the problem fully. ** Accomplished using a system extension; shipping version incompatible with System 7.5.

The Presenter Mac/PC

"TV can be as good as Monitor," says the packaging for this sleek black converter ($429; Consumer Technology Northwest, 503/643-1662). Despite its Hong Kong return address, the unit has a European twist. It supports the European television-signal standard, known as PAL. It also comes with a cable I've never heard of—called Scart—that supposedly produces a picture even better than S-Video. Of course, only European TV sets have Scart connectors, and *Macworld*'s editors refused to fly me to Paris for testing.

Large front-panel knobs adjust the position and width of the TV image; an array of only slightly infuriating DIP switches correct horizontal overscan and switch between PAL and American-style TV. The absence of a brightness knob made me a little nervous, but the picture was so clear, and the colors so true, I didn't much mind. Only the high price gave me pause.

TV Gamer Plus

You'd be forgiven for scoffing at the name of this thing. I mean, it's got to be a little demeaning to stand there in the conference room, explaining your department's goals for the year 2000, with something called a TV Gamer dangling from your PowerBook.

But make no mistake, this smooth, black box delivers a perfectly sharp, bright picture. A setup diagram is painted right onto the bottom of the box. It's got a good, illustrated manual and a brightness knob. And it's only $209, half the price of some rivals (SIIG, 510/657-8688).

At that price, you'd expect to find an Achilles' heel—and you do. This unit offers absolutely no solution to the overscan problem—the edges of the TV screen always chop off your menu bar and Trash Can. Rats!

TV Scan

The TV Scan is low-slung, white, and industrial-looking. It's the only converter that can't show an image on *both* normal and S-Video equipment simultaneously (if anybody cares). Also, there's not a single illustration in the manual. That's a problem, because there are otherwise no hints for identifying the "DB-15," "RGB video monitor," and "VGA HD-15" cables you're supposed to hook up.

There are likable aspects of the TV Scan: its bright, clear picture; nudge keys for picture position; and dials that help solve the overscan problem. But at $399, the TV Scan (ComputerVideo, 603/434-0800) is simply overpriced and underexplained compared with its competition.

MediNet Encoder

This sleek black box has picture-positioning knobs and a Brightness dial; creates a bright, clear picture; and sports a rock-bottom $159 price tag. That's a lot of features for very little dough (P2 Systems, 206/525-2081).

The thing is patently geared toward IBM-type computers, though; by way of instructions, you get a few flimsy Xerox pages called Mac Supplement. It's printed—I kid you not—in *5-point type*. The product itself is alternately referred to as *Medinet* and *Midinet* in that "manual."

But if I had to choose, I guess I'd rather have the $200 savings than a nicer manual. Once you're running the thing, all you really care about is how well it works. And this one works wonderfully.

P.S. again—Skimming into my mailbox at deadline time was the Encoder *Pro* ($249). This fancier box adds a Mac jack for your monitor, as well as a freeze-frame button. And it had no overscan problems, even without software.

TelevEyes/Plus

I like to think of the TelevEyes/Plus as the one converter designed for use by humans. "User-friendly" is written all over this thing, from its plain-talkin' manual to its ingenious white-on-black, top-panel labeling of all the jacks. Finally, you get a free, lite version of Action, the Macromedia presentation software, when you register.

Believe it or not, the TelevEyes/Plus is also the only box I saw that includes any *sound* features. Sure, when using any converter box, you can run a cable from your Mac's sound-output jack to your TV or VCR. But this one has a volume knob, a built-in amplifier for use with a microphone, and two different kinds of input and output jacks (miniplug and RCA). And my friends and I all agreed that the TelevEyes/Plus delivered excellent color, clarity, and stability. The price—$449.95—is the only catch. Only you can decide whether or not the TelevEyes/Plus audio features merit the added cost (Digital Vision, 617/329-5400).

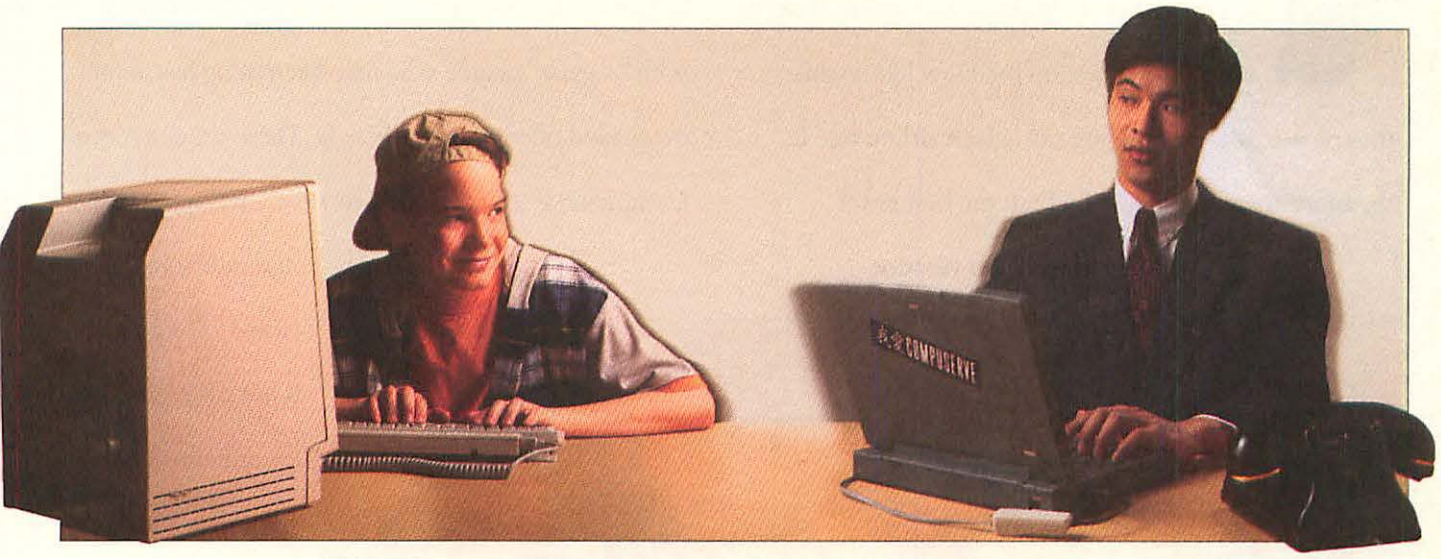
The Upshot

Remember, no image ever looks as sharp and satisfying on a TV as it does on the Macintosh. Furthermore, the pictures produced by all these rivals are so similar that you would have to be superhuman to declare a winner—and you would probably be imagining things, too, because the innards for most of these units are manufactured by the same Taiwanese factories.

Just one more caution. Your TV (or a VCR attached to it) must have either a round RCA input jack or an S-Video jack. If your TV is older and has no connection jack except two screws, you have to get an "RF adapter," and your Mac images won't look good at all.

So what's my recommendation? If stranded on a desert island with nothing but a Mac and a TV, I'd want either the L-TV (with its 800-number helpers) or the dirt-cheap, full-featured MediNet (or however they decide to spell it). And then I'd sign up for HBO. ■

Contributing editor DAVID POGUE wrote the best-selling Macintosh book in 15 countries: *Macs for Dummies*, third edition (IDG Books Worldwide, 1994). Except during tests for this column, his TV hasn't been on in months.



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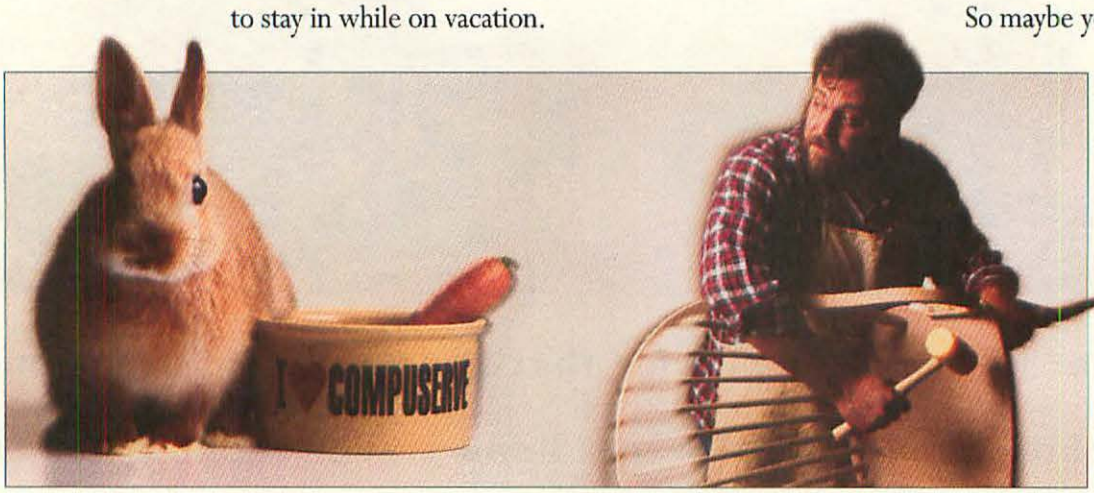

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THE ICONOCLAST

BY STEVEN LEVY

Send in the Clones

Apple's licensing approach is a bad idea

AT ANY OTHER TIME IN THE past decade, Don Strickland's job description would have been a hell of an eye-opener. He is Apple Computer's vice president in charge of licensing operating systems. Talk about oxymoronic! Until 1994, directing Apple's efforts at licensing the Macintosh OS would have been the ultimate do-nothing job. Sort of like running the Vatican's effort to distribute birth control materials. Or heading the American trade office in Havana.

Yet that is what Don Strickland is doing: overseeing, for the first time ever, an effort to bless companies that wish to produce and sell Power Mac clones. (Apple is willing to discuss licensing clones of the 680X0, but no one seems interested.) As I write this, the names of potential cloners are being floated—everyone from Fujitsu to IBM—and by the time you read this Apple will probably have announced a few.

There are now about 70 people, says Strickland, "dedicated to the Mac clone effort," and he sees the number eventually growing to a phalanx of 200. Two hundred people, whose entire professional existence is devoted to renting out the Mac OS, the company's most valuable asset. Even at Apple it would be difficult to launch an effort of that size and see absolutely no result.

Mac clones are coming, and Apple is entering uncharted territory—dangerous territory. Expect the worst.

Of Cursor Keys and Kings

To say that Apple Computer has always been protective of the Macintosh OS is an understatement of titanic proportions. In the chess game of personal computerdom, Apple has regarded the aggregation of elements that make up the Mac as the equivalent of the king. Anytime a possible infringement, even an imaginary one, came to light, Apple heard "check," and scrambled to protect the one piece in chess that is never sacrificed.

Others said that Apple's protectiveness was misguided. These critics did not think in terms of chess, but business. "Market share!" they cried, noting quite reasonably the constant perils of a company whose customers made up a mere sliver of the market pie-chart. The way to get a bigger piece of the pie was to bless the efforts of other companies to produce Macintosh clones. According to these pundits, if low-overhead, highly discounted overseas companies had stamped out $1000 computers that run Mac software, many people would have chosen the demonstrably superior Macintosh Way—especially in the crucial years before Microsoft introduced Windows 3.0, the first version of Windows worth running.

But Apple resisted, probably because its leaders saw what happened in the early 1980s with IBM. When Big Blue introduced its PC, it failed to prevent a tidal wave of clones that ran the same software. (This was due in part to clever maneuvering by Microsoft, which, unlike IBM, collected a royalty from the clone companies.) On one hand, MS-DOS became an industry standard—but on the other hand it wasn't IBM computers that people were buying. It was the low-cost foreign-made clones, or the mail-order clones, or the high-quality, innovation-laden higher-end clones. IBM had lost control.

There was another way for Apple to get market share, of course—to get rid of the ridiculously high premium people had to pay to use the Mac. If Apple had cut its profit margins and made lower-cost computers, it would have won converts in the late 1980s. But Apple did not cut its margins and prices until the nineties, after the market-share battle was lost. And even now its prices aren't low enough to lure people over from the dominant camp.

Somewhat belatedly, market share is becoming an obsession with Apple. There is a real danger that third-party providers, particularly ones hatching innovative new software, will simply choose to ignore the Mac platform, and despite the stellar performance of Power Macs, Apple products will continue to be marginalized—or worse. Apple's answer is clones. "Our worldwide market share is now 11 percent," says Strickland. "The domestic share is around 15 to 16 percent." By blessing clones, he says, "We want to grow the logo by 25 percent, which means three to four points in the next three to four years." Strickland is talking a million clones a year.

Self-Inflicted Revolution

It sounds nice, picking up those points. But the accommodations for this event have led Apple to remake its very foundation—in a sense, to inflict a revolution upon itself. It all begins with what Apple calls "a new visual identity for the Macintosh Operating System," which is now officially known as the Mac OS. The logo is a variation on the familiar happy-Mac—a jagged line runs down the center so you view the smiling face both head-on and in profile simultaneously. Some might interpret it to mean that happy-Mac now suffers from multiple-personality syndrome, but Apple claims it signifies a "more open approach to attracting new users to the platform." The logo will appear on software prod-

continues

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ucts and product literature from Apple and other companies. And it will light up computer monitors every time you turn on an Apple computer—or a clone from another company.

The real message is that the computers Apple now makes are not really Macintoshes, just one member of a family that happens to share the same operating system. "With our Mac OS logo, the name 'Mac OS' will refer to the operating system not only sold by Apple but by others," Strickland told me. Then he said something that almost made me drop the phone: "We have no products that are called Macintosh." Apple doesn't make Macintoshes anymore? Apparently not. "We have Quadras, PowerBooks, Performas. . . . Legacy-wise the name is important, but not officially. Over time, the Macintosh name will be less important."

Barbarians after Gates

Somehow this is not encouraging. How should we react to the news that Apple has developed a logo that software developers can stick on a box to demonstrate compatibility with the Mac OS? Hasn't the idea all along been that Macintosh software works with Macintoshes?

Oh, I forgot. There are no more Macintoshes—just computers that run the Mac OS, some of which will be made by Apple. And the others? Don Strickland says that in the first round of the licensing, Apple may focus on manufacturers intending to bring the Mac OS to markets that Apple, due to its limited resources, simply hasn't been able to address—publishing markets in certain foreign countries, for instance. But eventually Apple will not shirk at licensing the Mac OS to companies that may compete directly with Apple. Even at lower prices. "If you sell it for half as much as Apple does," says Strickland, "that's fine." Really?

Other companies—maybe even IBM—might try to combine the Mac OS with some new twists. Imagine a box like the Power Mac that runs native software and a built-in emulation mode—of Windows software. Apple claims to welcome any of these innovations.

But what about Apple's own innovations? Innovation is the very heart of Apple's mission—the impetus that created the operating system in the first place. Apple is currently constructing a number of new operating systems, some of them presumably loaded with the sorts of things that Apple hopes will catapult the company back into its position as technology leader. Will these innovations be instantly available to the clone makers of the current Macintosh OS?

Don Strickland admitted that Apple doesn't have the answer to that question. Neither did he have anything to say about the possibility that Apple's new operating systems not shared with clone makers might lead to a new era of confusion, as customers try to sort out which Apple-flavored operating system supports which feature. There are questions concerning limitations that Apple might place upon itself when considering new innovations—would an installed base of non-Apple clones act as an impediment to future greatness? The beauty of a closely held system was that Apple had the freedom to implement even those changes that required hardware adjustments. What happens when a significant percentage of its user base buys from other manufacturers?

Despite these unresolved questions, the company is plunging into the clone zone, holding an ivory king in its open hand. "We're going to be competitive with Microsoft, whatever it takes," promises Strickland.

That's where it's all headed, of course. Apple wants to be Microsoft. Making Macintoshes doesn't seem to interest Apple any more. (If it did, perhaps Apple would try to increase market share by doing whatever it takes to meet customer demand for its current products.) "Creating a separate identity for Apple is a shot across Windows' bow," said Guerrino De Luca, vice president of marketing in the AppleSoft Division, in an Apple press release, neatly illustrating the company's delusions.

I still think that Apple is capable of the sort of innovation that can, if well marketed and competitively priced, increase its share of the world market—without Mac clones. But if it tries to compete directly with Microsoft, whose bread and butter is licensing operating systems, Apple will lose. The tens of millions of people already wed to the Microsoft world have been well trained to expect innovation in limited doses, preferably with full DOS compatibility. Inertia, not innovation, is the name of that game. In addition, the leaders of Apple are no match for those who run Microsoft—to think that Apple can come from behind and eclipse Gates and company is folly of the first order. Apple's first instinct was right. Protect the king. I look at the clonal happy-Mac logo for the new, not-made-by-Apple future, and can't help but ask: Why is this face smiling? m

STEVEN LEVY'S latest book is *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994). He is a Fellow of the Freedom Forum Media Studies Center in New York.

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The unit's built-in fax software permits users to send a drawing, a letter, or even an entire folder of documents. The software also provides a speed-dial directory and automatically creates a cover sheet for outgoing faxes. By entering the terminal mode the OZ-9520FX uses ASCII or VT-100

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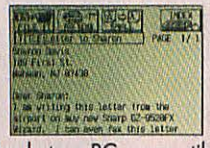
A word processor with cut, paste, and a variety of text styles enables you to produce professional-looking letters. Completed documents can then be beamed to a colleague's Wizard or output wirelessly to a PC-compatible printer with the optional infrared adapter.



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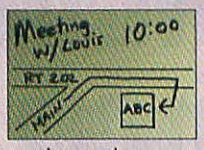
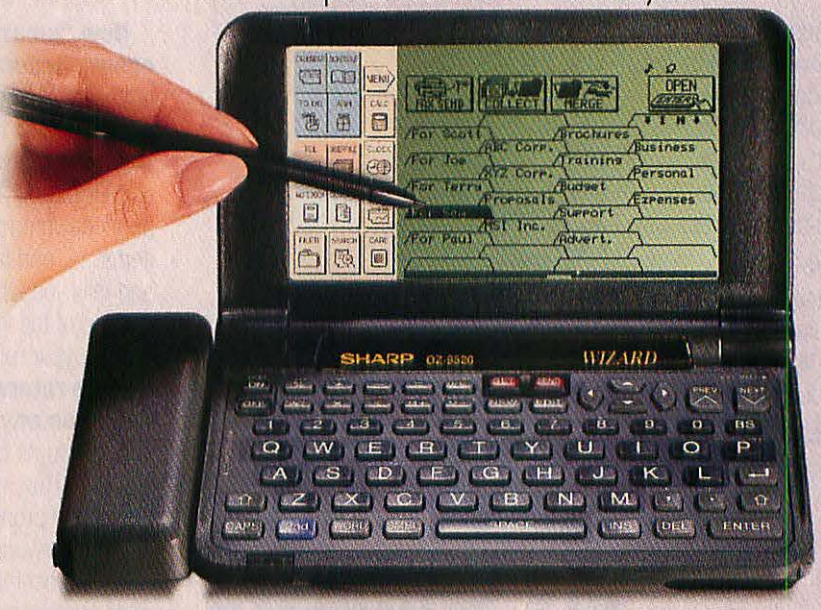
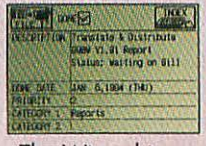


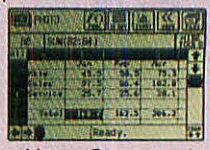
directly on the screen using the Wizard's stylus or your finger. Images can also be imported from a PC or Mac® into Scrapbook enabling telephone entries, for example, to have portraits or maps attached to them. A unique Filer system–of graphically represented folders–groups related information together by subject, making it ideal for project management.



And when it comes to time management, Wizard sets the standard. Four different calendar views, 3 phone directories, a To Do list, and there's even a function that allows you to enter annual events, like birthdays and anniversaries, so you'll never miss a moment.



The Wizard is your virtual office. No matter where the day takes you, creating a spreadsheet is as easy as inserting the optional PenCell® spreadsheet card.



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East West Development

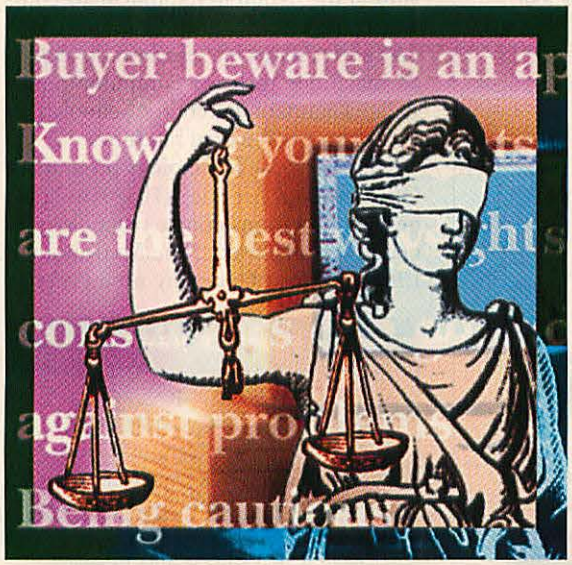
Thanks to the East West Development Education Foundation and its donors, the Civic Alliance of Mexico was able to monitor the presidential election last August and complete a parallel vote tally after the election. In the previous election, fraud was suspected after the vote-counting machines broke down. This time, the Civic Alliance intended to ensure the vote was honest.

"We had our gear up and running by Friday," says East West president Alex Randall. Both East West and the United Nations sent computers to the Civic Alliance; East West included a technical team as well. "On Saturday all the equipment was sabotaged. Or perhaps not sabotaged. It may have been done by a well-intentioned, very stupid person." Whatever the case, the team discovered viruses on all the computer systems and had to reroute cabling; out of some 40 systems, only 4 would actually start. East West's technicians went to work; the equipment was functioning again by Sunday noon, election day.

East West is a Boston-based nonpartisan and nonprofit organization founded in 1990 by Patrick McGovern, the founder and chairman of International Data Group, the parent company of *Macworld*. In 1991, Randall came on as president and the organization became independent of IDG, but it continues its mission to place computer systems where they can help foster democracy.

East West has placed more than 6000 computer systems in more than 150 countries. In the former Yugoslavia, Sarajevo's remaining newspaper and radio station, and a theater have received East West–donated computers. East West is working to establish an Internet site in Sarajevo so the city's besieged residents can communicate with the outside world. Closer to home, East West has placed computer systems in YMCAs, hospitals, schools, and other nonprofits.

One element in East West's success is its flexibility; the group accepts all or part of a personal computer system, even if broken. Paid technicians and volunteers repair and create full systems out of peripherals and parts, matching a donation of keyboards with another of monitors and CPUs. Donations from Compaq and Microsoft ensure that legal software is available for each machine.



Although East West prefers to receive 80286- and 386-based PCs and Mac II–level computers, it also accepts and places older machines that may seem outdated for modern offices. "Many times, the amount of computer power used vastly exceeds [the needs of] the application," says Randall. "My folks are perfectly happy using mundane technology because it meets 100 percent of their needs."

One example is the original 1984-era Mac. "Send me the 128s, I love them," says Randall. "We consider them part of a package; we gather 128K Macs and add a higher-level machine like a IIcx. That's a desktop publishing system for a Third World country—128s are quite adequate for reporters."

For more information on East West programs, call 617/542-1234. To receive faxed information, call 617/542-2345.

Non-Profit Computing, Inc.

For nearly ten years, Non-Profit Computing has matched computer donations to needy groups. Unlike most other computer-donation groups, NPC accepts any obsolete computer equipment, from mainframes to personal computer components to telecommunications equipment. Currently, it's looking for a home for a Northern Telecom switch that supports 800-number telephone lines.

"We're still happily dealing with people who [want to donate] pieces of a Commodore 64," says NPC founder John L. German. "Obsolete is a relative term." NPC places equipment primarily on the East Coast, but sometimes ranges farther afield. The Mongolian National University, for example, received a computer lab last year courtesy of NPC and its donors.

NPC also helps individuals through its Career Development Group. CDG matches out-of-work computer-telecommunications professionals with internships and volunteer work that hone their skills for future employment. Volunteer work for employed professionals who want to donate their skills is also available. Call 212/759-2368 for details.

continues

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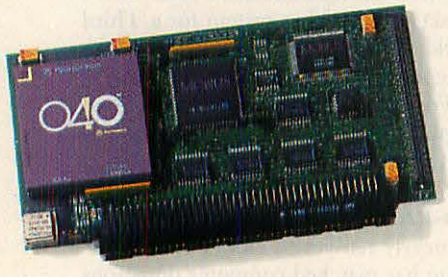

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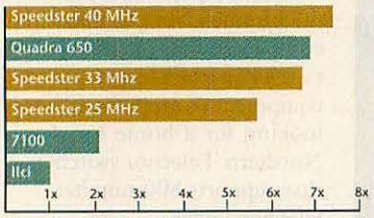

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Computer Recycling Center

Two years ago, Mark Hass, a former robotics engineer for Quantum Corporation, created the nonprofit Computer Recycling Center to divert old computer systems from landfills into schools. Today, 3 staff members and more than 150 volunteers collect and refurbish donated computer hardware, software, and peripherals at the Mountain View, California, center. After any necessary repair, donated equipment is placed in schools and supported by CRC volunteers for a total cost of about $50 per computer.

IBM computers (from PCs to 486s) and compatibles are the most common donations to CRC, but Apple II's, Macintoshes, and Sun Unix systems are gladly accepted also, along with any available software. Monitors, printers, and hard drives are also welcome. CRC offers network training courses, which help support the organization. For information, call 415/428-3700.

Other Options

The Computers for Schools Program (619/456-9045, 800/939-6000) of the Detwiler Foundation is a California-only project that is also dedicated to adding computers to state public and private K–12 schools (California reportedly ranks 48th in the nation in its student-to-computer ratio). Students at vocational training centers statewide refurbish the donated machines to learn computer-repair skills. Then Computers for Schools find homes for the repaired machines.

The Recycle Technology program of Gifts In Kind America (703/836-2121) helps corporations donate technology to needy organizations. The Metropolitan Life Insurance Company used Gifts In Kind America to place 600 used laptop computers. The laptops went to groups aiding childhood immunizations, coordinating Midwest flood relief, assisting California earthquake victims, and supporting volunteer programs. Gifts In Kind America makes it easy for corporations to donate equipment to good causes.

The National Cristina Foundation (203/622-6000, 800/274-7846) matches donated systems with 500 nonprofit organizations that use them for computer training and the rehabilitation of disabled and disadvantaged children.

If you'd rather donate time than equipment, check out CompuMentor. This San Francisco–based group matches computer whizzes to nonprofits that need help. Such mentors may develop custom databases, set up a network, or troubleshoot a system crash. The group matches experts to nonprofits in California only, but has affiliates in some other cities. For more info, call 415/512-7784.

Donate Wisely

If your company is donating old machines that are being replaced by new ones, part of the deinstallation costs are tax deductible, according to East West's Alex Randall. The full costs of packaging, handling, and shipping are also deductible.

According to Henry Holmes of the Internal Revenue Service, there's no magic formula for determining the value of a used computer for the purposes of a charitable tax deduction. Donors need to use "fair market value" to figure the worth of their donations. Owners can gauge the value of their donations by using something like the AmCoEx Used Computer Index published by *Macworld* or by checking classified advertisements. Federal tax law limits deductions for charitable donations to 50 percent of your income; up to that amount, you can deduct the full value of charitable donations.

Donating computer equipment is a generous act; make sure it's an effective act as well. If you plan to donate to a particular school or organization, make sure your system is compatible with its existing equipment, includes or is matched with the legal software necessary to the site's goals, and that technical support is available for setting up and supporting the system. Don't have the time? Then donate equipment—or cash—to one of the groups above. That simple act may touch many lives in a positive way. **m**

SERVICE HERO

Ivan Pelly sends word via America Online of his satisfaction with Dantz Development Corporation. Pelly writes that unlike other software companies he has dealt with, Dantz is able to keep track of him as a customer. Recently, for example, Pelly called Dantz to order the upgrade for Retrospect. " I didn't have the serial number handy, but they immediately found my registration from three years ago. Their excellent and extremely reasonably priced upgrade arrived within 24 hours and worked perfectly right out of the package."

Send nominees for sainthood to *Service Heroes, Macworld*, 501 Second St., San Francisco, CA 94107 or via the Internet (branscum@aol.com). Also, drop *Conspicuous Consumer* a line if a company is ignoring you.

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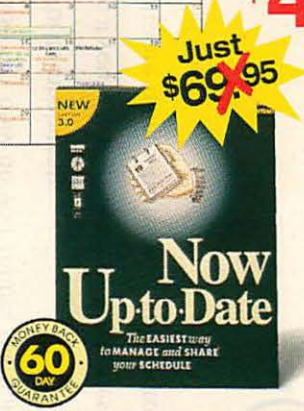

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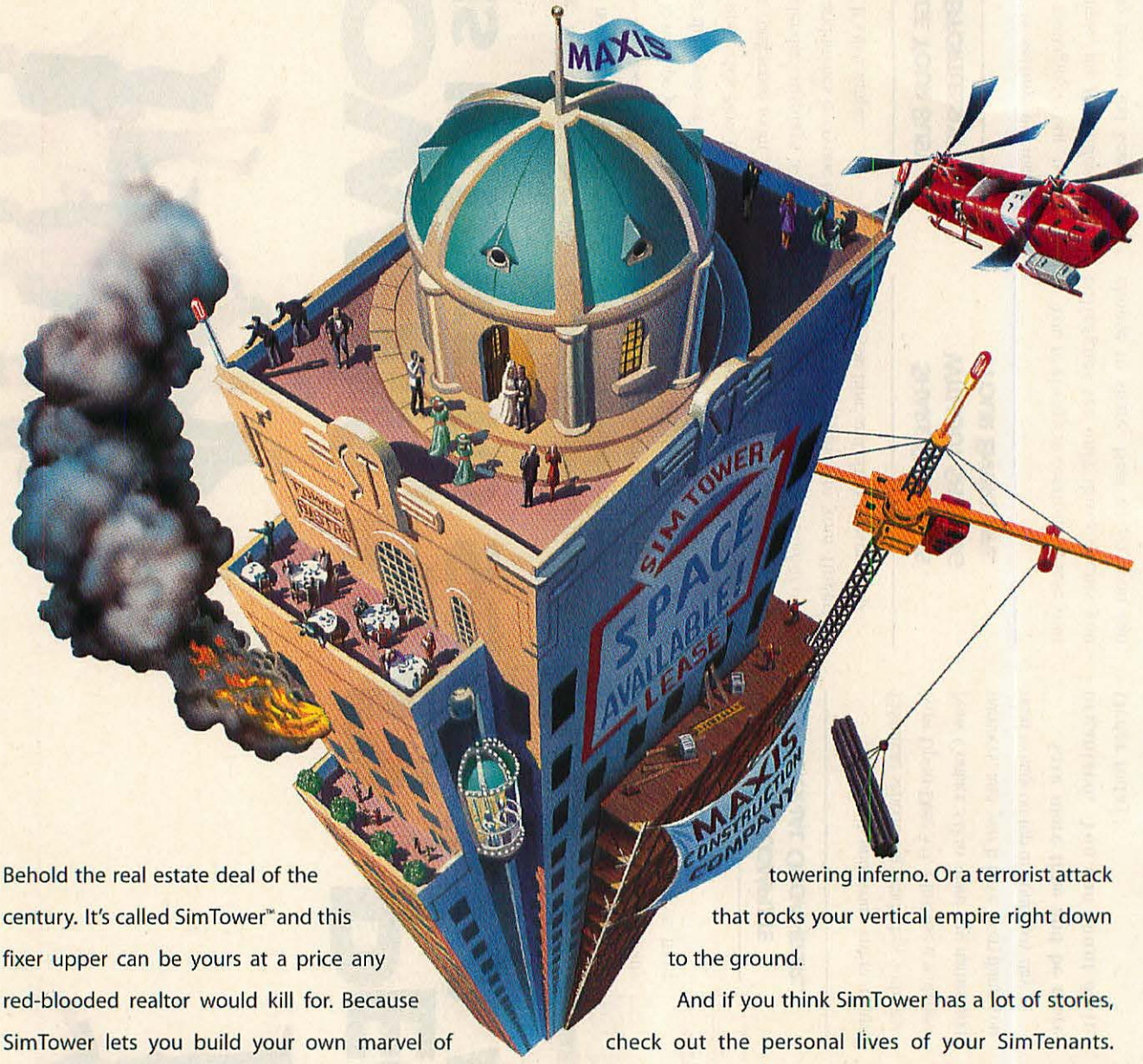

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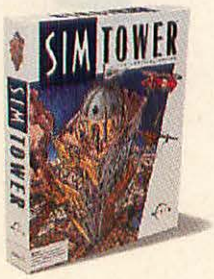

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Editors' Choice

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Elizabeth Maffly

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in *Macworld*'s comparative articles. A ❖ next to a product indicates that we chose more than one product in that category. A ◀ next to a product listing indicates that a native Power Mac version is available.

Hardware

MONITORS

SMALL COLOR MONITORS, Jan 94

14-inch display: ❖ Sony CPD 1430; Sony Corp. of America, 800/222-7669; $779.95.

❖ Nanao FlexScan F340i•W; Nanao USA, 800/800-5202; $799.

15-inch display: NEC MultiSync 4FGe; NEC Technologies, 708/860-9500; estimated street price $755.

TWO-PAGE COLOR MONITORS, Nov 94

PressView 21 Display System; SuperMac Technology, 408/541-6100; $3999.

NETWORK HARDWARE

HIGH-SPEED FAX MODEMS, Oct 93

Teleport Gold and Silver with Global Fax; Global Village Communication, 415/390-8200; Gold $499, Silver $429.

REMOTE-ACCESS SERVERS, Oct 94

Mixed networks: NetConnect Remote Access Server; Asanté Technologies, 408/435-8401; $3899 for eight ports.

AppleTalk networks: ARA Multiport Server; Apple Computer, 408/996-1010; four ports $1799, eight ports $3298.

PRESENTATION HARDWARE

PORTABLE PRESENTERS, Jan 95

Z115; nView, 804/873-1354; $5495.

PRINTERS

COLOR PRINTERS, Aug 94

Low-end ink-jet: DeskWriter 560C; Hewlett-Packard, 800/752-0900; $719.

Solid ink-jet: Phaser 300i; Tektronix, 503/682-7377; $9995.

Thermal-wax transfer and color laser: Phaser 220i; Tektronix, 503/682-7377, $5995.

DYE-SUBLIMATION PRINTERS, Jul 94

Prepress proofing—tabloid size/fastest: Phaser 480; Tektronix, 503/682-7377; $14,995.

Prepress proofing—tabloid size/most complete: Rainbow; 3M, 612/733-1110; estimated street price of $20,000.

Prepress proofing—letter size: ProofPositive Full Page; SuperMac Technology, 408/541-6100; $7999.

General publishing and business: Phaser IISDX; Tektronix, 503/682-7377; $9995.

PERSONAL PRINTERS, Sep 94

Ink-Jet: DeskWriter 520; Hewlett-Packard, 800/752-0900; $365.

Laser—$1000 to $1600: microLaser Pro 600; Texas Instruments, 214/995-6611; $1599.

WORKGROUP PRINTERS, Feb 94

High-speed: Hewlett-Packard 4Si MX; Hewlett-Packard, 800/752-0900; $5499.

Best buy: ❖ Apple LaserWriter Pro 630; Apple Computer, 408/996-1010; $2529. ❖ Hewlett-Packard LaserJet 4M; Hewlett-Packard, 800/752-0900; $2329.

SCANNERS/IMAGE CAPTURE

ELECTRONIC CAMERAS, Sep 94

Apple QuickTake 100; Apple Computer, 408/996-1010; $749. ◀

LOW-COST COLOR SCANNERS, Nov 93

$1300 to $1600: ❖ La Cie Silverscanner II; La Cie, 503/520-9000; $1599.

❖ Hewlett-Packard ScanJet IIc; Hewlett-Packard, 800/752-0900; $1599.

Under $1300: Mirror 800 Plus Color Scanner; Mirror Technologies, 612/633-4550; $1299.

OCR, Nov 93

OmniPage Professional; Caere Corp., 408/395-7000; $995. ◀

SYSTEMS/STORAGE

1.3GB OPTICAL STORAGE, Dec 94

Best low-cost solution: 1.3Gig MO; Club Mac, 714/768-8130; $2099.

Best overall performance: Genesis 1300; Microtech, 203/468-6223; $2899.

DOUBLE-SPEED CD-ROM DRIVES, Jul 93

Sheer speed: Pioneer DRM-604X; Pioneer, 800/444-6784; $1495.

Overall value: AppleCD 300; Apple Computer, 408/996-1010; $599.

Budget choice: NEC MultiSpin 38; NEC Technologies, 708/860-9500; $465.

HIGH-SPEED HARD DRIVES, Aug 93

2.7GB drives: ❖ Nova XL 2700; Microtech International, 203/468-6223; $2999. ❖ Vista 3.5GB; Relax Technology, 510/471-6112; $3499.

SCSI-2 adapter: QuickSCSI; PLI, 800/288-8754; $499.

MACINTOSH UPGRADES, Jun 93

SE accelerator (25MHz): Quik30; Novy Systems, 904/427-2358; $449 (without FPU).

SE/30 accelerator (50MHz or 33MHz): Universal PowerCache; DayStar Digital, 404/967-2077; 50MHz $999 (with FPU), 33MHz $449 (without FPU).

LC and LC II upgrades: Macintosh LC III Logic Board Upgrade; Apple Computer, 408/996-1010; $599.

Mac II accelerators: ❖ Radius Rocket 25i, Radius Rocket 33; Radius, 408/434-1010; 25i $1199, 33 $2499.

❖ Universal PowerCache series; DayStar Digital, 404/967-2077; $449 to $999.

IIfx SCSI accelerator: QuickSCSI; PLI, 800/288-8754; $499.

Quadra static-RAM cache card: FastCache Quadra; DayStar Digital, 404/967-2077; $299 for Quadra 700 and 900, $449 for Quadra 800 and 950.

PC COPROCESSING, Oct 94

OrangePC Model 210; Orange Micro, 714/779-2772; $1283.

VIDEO/DISPLAY

24-BIT VIDEO CARDS, Apr 94

Inexpensive acceleration: PrecisionColorPro 24XP; Radius, 408/434-1010; $599.

Full-featured acceleration: Thunder II GX•1360; SuperMac Technology, 408/541-6100; $4499.

HIGH-END VIDEO EDITING, Jun 94

Presentation video: ❖ MoviePak2 Pro Suite; RasterOps, 801/785-5750; $4199. ❖ VideoVision Studio; Radius, 408/434-1010; $4499.

Corporate video (offline): Media Composer 400s; Avid Technology, 508/640-6789; $14,995.

Corporate video (online): VideoCube; ImMix, 916/272-9800; $40,500.

PHOTOSHOP ACCELERATORS, Apr 94

PhotoBooster; Radius, 408/434-1010; $999.

continues

MACWORLD Editors' Choice

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93
Small-business system: M.Y.O.B.; Best Ware, 201/586-2200; $199.
Home office/personal finance: MacMoney; Survivor Software, 310/410-9527; $119.95.

BUSINESS TOOLS

STATISTICS, Oct 93
Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; $595.
Comprehensive package: SYSTAT 5.2.1; SYSTAT, 708/864-5670; $895.

CD-ROM

TOP 10 CD-ROMS, Mar 94
Overall: Seven Days in August; Time Warner Interactive Group, 818/955-9999; $79.99.

COMMUNICATIONS/NETWORKS

COMMUNICATIONS SOFTWARE, Aug 94
Basic connectivity: ZTerm; David P. Alverson (no phone number available); $30.
Terminal emulation: Crosstalk for Macintosh; Digital Communications Associates, 404/442-4000; $195.
Internet exploration: VersaTerm; Synergy Software, 215/779-0522; $125.

DOS WINDOWS EMULATION, Oct 94
Timbuktu Pro 1.0.3 for Macintosh, Timbuktu 1.1 for Windows; Farallon Computing, 510/814-5000; $199 each.

HIGH-SPEED FAX MODEM SOFTWARE, Oct 93
Faxstf; Telefocus, 816/886-9800; $79.

NETWARE CONNECTIVITY, Sep 93
NetWare for Macintosh; Novell, 801/429-7000; $495 for 5-user license to $2295 for 200-user license.

PROTOCOL ANALYZERS, Jul 94
EtherPeek, AG Group, 510/937-7900; $795.

TERMINAL EMULATOR, Oct 93
VersaTerm; Synergy Software, 215/779-0522; $149.

GRAPHICS

3-D MODELING, Dec 94
Stand-alone modeler: Form Z; autodessys, 614/488-9777; $1495.
Integrated-modeling package: Strata StudioPro; Strata, 801/628-5218; $1495.
Entry-level modeler: Infini-D; Specular International, 413/253-3100; $695.

CLIP ART'S GREATEST HITS, Jan 94
Overall collection: ❖ ClickArt Studio Series; T/Maker Company, 415/962-0195; $99.95 per volume.
❖ Electronic Clipper subscription service; Dynamic Graphics, 800/255-8800; $67.50 per month.
❖ Metro ImageBase Electronic Clip Art; Metro ImageBase, 800/525-1552; $74.95 per volume, CD-ROM $149.95.
❖ Images with Impact series; 3G Graphics, 800/456-0234; $99.95 to $129.95 per volume, CD-ROM $499.
❖ Typographers' Ornaments; Underground Grammarian, 609/589-6477; $25 per volume; ten TIFF albums $200; EPS volumes $50 each.

DRAW PROGRAMS (LOW-COST), Sep 93
Budget draw: Expert Draw; Expert Software, 305/567-9990; $49.95.
Budget draw/paint: UltraPaint; Deneba Software, 305/596-5644; $79.
Beginners' program: Aldus SuperPaint; Aldus Consumer Division, 619/558-6000; $149.95.
Overall: Canvas; Deneba Software, 305/596-5644; $399.

FONT BUYERS' GUIDE, Mar 94
Text-face collection: Type On Call CD-ROM; Adobe Systems, 415/961-4400, 800/682-3623; $99 (this price includes the ability to unlock two families from preselected packages); an additional $25 enables you to unlock individual faces, or $69 to $179 for unlocking families.
Display/decorative-face collection: Fontek; Letraset, 201/845-6100; $39.95 per face.
Bargain collection: Monotype ValuePack; Monotype, 312/855-1440; $89 for 57 fonts.

IMAGE DATABASES, Oct 93
❖ Aldus Fetch 1.0; Adobe Systems, 206/628-5739; $295.
❖ Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1530; $249.

PAINT AND IMAGE-EDITING, Sep 93
Budget buy: Expert Color Paint; Expert Software, 305/567-9990; $49.95.
Overall program: Fractal Design Painter; Fractal Design Corp., 408/688-8800; $399.
Image-editing program: Adobe Photoshop 2.5.1; Adobe Systems, 415/961-4400; $895.

INTEGRATED SOFTWARE

INTEGRATED SOFTWARE, Feb 94
ClarisWorks; Claris Corporation, 408/727-8227; $299.

Vendors: Please write to *Macworld Editors' Choice*, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product's list price.

ONLINE SERVICES

ONLINE SERVICES, Aug 94
E-mail: America Online; America Online, 703/893-6288; basic monthly fee $9.95.
Reference: CompuServe; CompuServe Information Service, 614/457-0802; basic monthly fee $8.95.

ORGANIZATION/PRODUCTIVITY

CALENDARS, Jul 93
Alarm system: ❖ First Things First; Visionary Software, 503/246-6200; $79.95.
❖ Smart Alarms Plus; JAM Software, 203/630-0055; $75.
All-around scheduler: Now Up-to-Date; Now Software, 503/274-2800; $99.
Meeting scheduler: Meeting Maker; On Technology, 617/374-1400; five-pack $495.

GRAPHING SOFTWARE, Aug 94
DeltaGraph Pro 3 3.0.4; DeltaPoint, 408/648-4000; $195.

SALES-AUTOMATION SOFTWARE, Oct 93
❖ Contact Ease; WestWare, 619/274-5053; one user $395, five users $1495. ❖ CBS; Colleague Business Software, 512/345-9964; $495.

TEXT-RETRIEVAL SOFTWARE, Dec 93
Small system: On Location; On Technology, 617/374-1400; $129.
Multiuser system: Personal Librarian; Personal Library Software, 301/990-1155; $995.

PRESENTATION TOOLS

PRESENTATION SOFTWARE, Jul 94
Persuasion 3.0; Adobe, 206/622-5500; $495.

UTILITIES

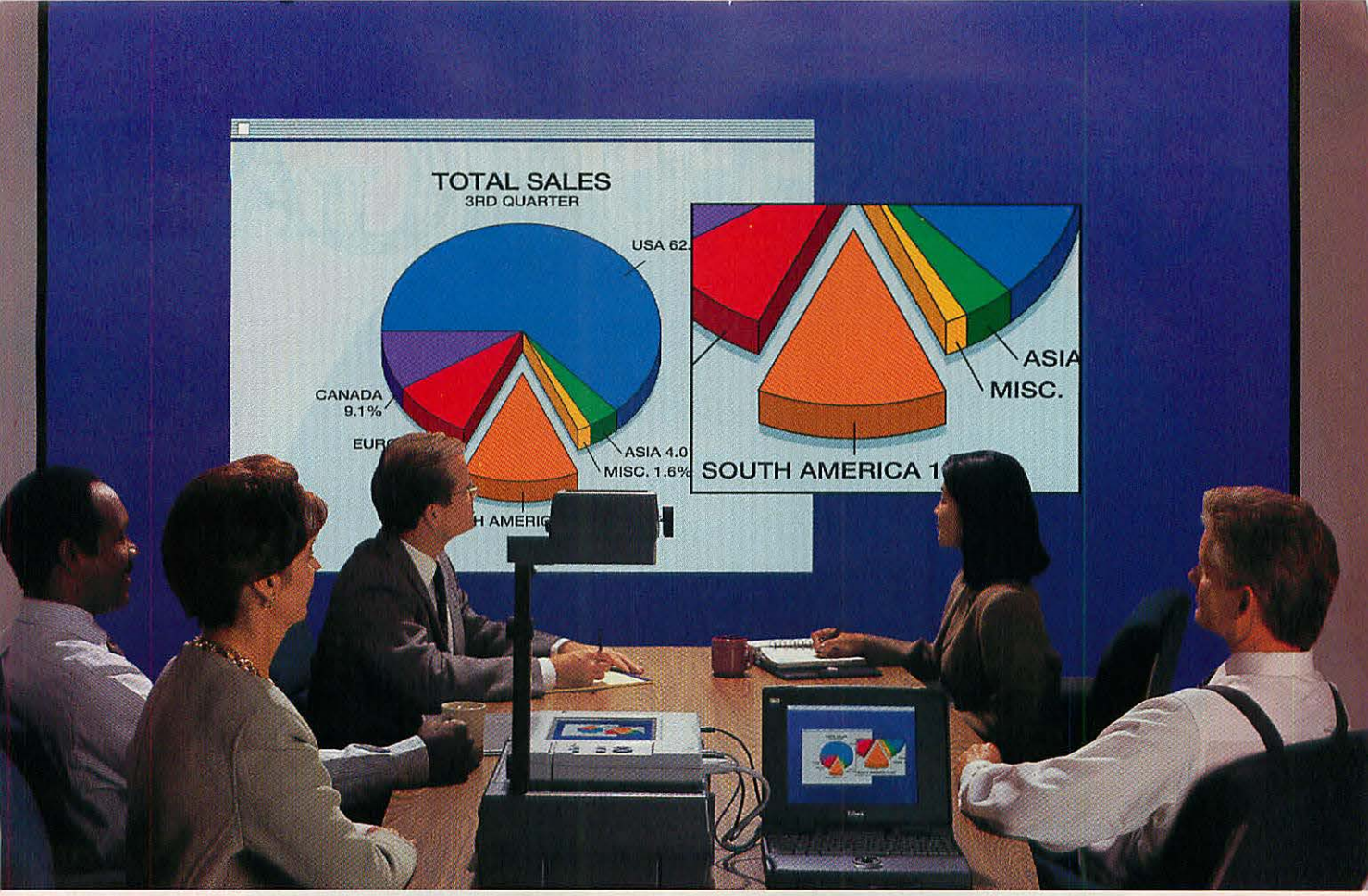
BRAVE NEW DOCUMENTS, Jan 94
Application-independent document distribution: Common Ground; No Hands Software, 800/598-3821; $189.95.
Book-length documents: FrameReader; Frame Technology, 800/843-7263; $84.95.

PRINTING, Sep 93
PC-printer cable packages: PowerPrint; GDT Softworks, 604/291-9121; $149.

VIRUS KILLERS, Jul 94
Commercial software: Virex; Datawatch, 919/549-0711; $99.95.
Free software: Disinfectant; free from online services.

VIRTUAL MEMORY SOFTWARE

VIRTUAL MEMORY, Jun 94
Virtual memory software: Virtual 3.0; Connectix Corp., 415/571-5100; $99.
Memory-boosting software: RAM Doubler 1.0.1; Connectix Corp., 415/571-5100; $99. m



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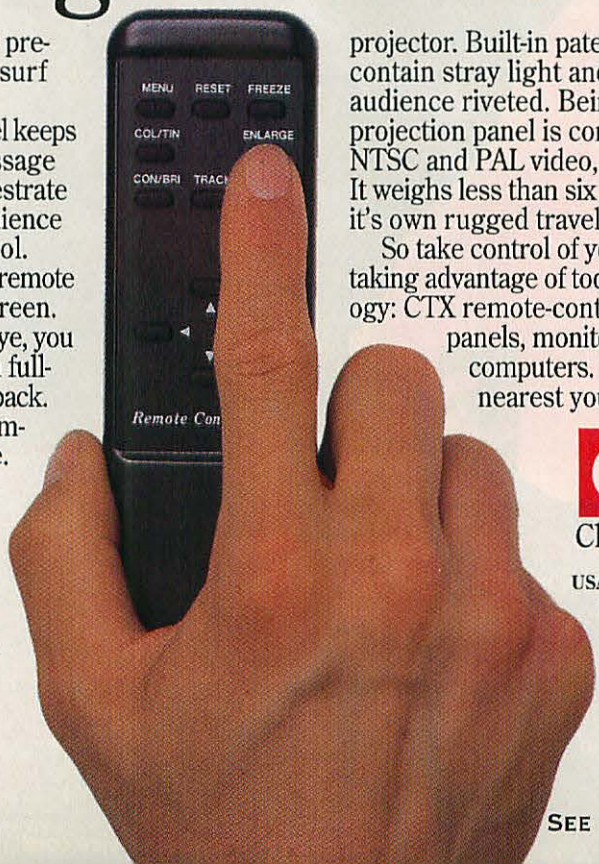

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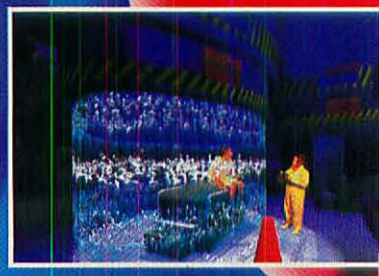

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Star Ratings

HARDWARE AND SOFTWARE REVIEWS AT A GLANCE

Edited by Wendy Sharp

Macworld Star Ratings lets you compare hardware and software products for the Macintosh by providing summaries of *Macworld*'s authoritative product reviews from the past year. The number of stars at the beginning of each capsule review indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones. The ◀ symbol indicates that a product is available in a native Power Mac version, although unless stated otherwise the version we reviewed was the 680X0 version.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to *Macworld Star Ratings*, 501 Second St., San Francisco, CA 94107 to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS TOOLS

★★★ **4D First 1.0 (1.0.1), ACI US, 408/252-4444, $295.** This entry-level relational database is a low-cost way to distribute the power of 4D and 4D Server to an office full of Macs. It's not much easier to use, however, than the full-fledged 4D. May 94 ◀

★★★ **AccuZip6 1.8.7, Software Publishers, 800/233-0555, $689.** Bulk-mail software has informative progress indicators, batch and individual processing, low rates, and flexible parsing during import, but the interface is incomprehensible. Sep 94

★★ **BaseMap 1.0.1, GeoPoint, 415/957-1560, $149.** For simple maps displaying simple data, this map-making tool may be useful. It's not for the cartographic sophisticate, however, as it offers very limited data-display abilities and only one projection. May 94

★★ **Bulk Mailer CASS 1.00d, Satori Software, 206/443-0765, $150.** Unattended operation is possible with this bulk-mail software, but batch processing is slow and the program has coding problems. Sep 94

★★★ **CA-Cricket Graph III 1.52, Computer Associates International, 516/342-5224, $129.** Graphing software's features are just right for charts in the physical and social sciences, but lack pizzazz. The program is easy to learn and use, and includes math features for data transformations and curve fitting. Dec 94

★★★★ **ClarisImpact 1.0 (1.0 v3), Claris Corp., 408/727-8227, $399.** Business graphing, project management, object-oriented drawing, word processing, and presentation functions merge in this business graphics software. The outstanding integration offers versatility that dedicated programs are pressed to match. Jun 94 ◀

★★★ **Cricket Graph III 1.5 (1.52), Computer Associates International, 516/342-6000, $129.** Basic and foolproof charting program produces cleaner charts than Excel with little effort, although its feature set is fairly modest. Apr 94

★★★★ **Crystal Ball 3.0, Decisioneering, 303/449-5177, $295.** Compact business-simulation software is fast enough for complex projects and can pay for itself in disaster-avoidance in a variety of business tasks. Oct 94

★★★★ **Decision Analysis 2.5, TreeAge, 800/254-1911, $379.** Decision-assistance software handles complex business cases by constructing tree diagrams of probabilities and payoffs. It offers a type of modeling that is more realistic and easier to modify than other options. Nov 94

★★★★ **DeltaGraph Pro 3 (3.5), DeltaPoint, 408/648-4000, $195.** At its new lower price, this charting program is the best feature-for-feature value in Macintosh charting. There's even a new Chart Advisor function that suggests the appropriate display for your data. Apr 94 ◀

★★★ **Extend+BPR 3.0, Imagine That, 408/365-0305, $990.** Business-modeling software includes superior templates for business-process reengineering, but some programming experience is helpful. Oct 94

★★★ **FastTrack Schedule 2.1, AEC Software, 703/450-1980, $279.** Simple project-management software is ideal for managers who need to put together a schedule quickly and easily, but if you require more power to manage conflicts between multiple projects and resource allocation, you'll need a more comprehensive program. Sep 94

★★★★ **Helix Express 2.0.1 (2.0.4), Helix Technologies, 708/465-0242, $589.** Icon-based relational-database software's improved performance makes it a serious competitor for all-Mac networks. Especially notable is its much faster speed; multiuser operation is downright snappy. Jul 94

★★★ **Map II 1.5, ThinkSpace, 519/858-5047, $395.** Well-structured program has most of the functions a simple geographical information system needs and is suitable for introductory instruction in GIS and for alert first-time users who just like maps. May 94

★★★ **MicMac 2.0v1, Nirvana Research, 408/459-9663, $89.** The concept of Mac as dictation machine is undeniably attractive, and Nirvana Research has pulled it off well. It takes lots of hard drive space to save recordings, though. Nov 94

★★★★ **Microsoft FoxPro for Macintosh 2.5 (2.6), Microsoft Corp., 206/882-8080, $495.** Dazzlingly fast and easy to use relational database has a greatly improved interface and cross-platform compatibility. For projects of 4 to 20 users that handle large amounts of data (hundreds of thousands to millions of records) it offers excellent performance. Apr 94

★★★★ **Pablo 2.0.1 (2.03), Andyne Computing, 613/548-4355, $695.** This effective end-user data-reporting tools puts a considerable workload on the corporate information department, but it sidesteps the hassles of SQL data access and produces great reports with minimal effort. Jul 94

★★★ **Street Atlas USA 2.0, DeLorme Mapping, 207/865-1234, $169.** For the most part, this geographical information software delivers what it promises at a great price. Although inaccuracies in the data are troubling, DeLorme pledges to fix all reported errors in subsequent annual updates. Oct 94

★★★ **TeamFlow 3.1, CFM, 617/275-5258, $295.** Total Quality Management flowchart software is a valuable business tool. Its report printing and customizability are limited, however. Nov 94

★★★★ **TopDown 4.0 (4.1), Kaetron Software Corp., 713/298-1500, $345.** Flowcharting program's support for custom symbols and automatic drawing aids, along with its ability to let you easily create and navigate lower-level charts, make it a productive tool. Jul 94

★★★★ **ZipZapp 1.0, True Basic, 603/298-8517, $39.95.** You can use this data-reference utility to find an area code, the correct spelling of a city's name, and more. The interface is intuitive, and the cost, low. Oct 94

★★★ **ZP4 12.1 (14), Semaphore Corp., 408/688-9200, $125.** Inexpensive bulk-mail software supports batch and individual processing, but the progress indicators are uninformative, and unattended operation requires extra work. Sep 94

COMMUNICATIONS/NETWORKS

★★ **AccessPC 3.0, Insignia Solutions, 415/694-7600, $129.95.** Utility translates most word-processor and some database formats, but it doesn't translate graphics and some of its translations result in data loss. Apr 94

★★★ **Crosstalk for Macintosh 2.0 (2.0.1), Digital Communications Associates, 404/442-4095, $195.** Commendable communications product has a feature set that well matches its competition. Still, the script editing is complex and you must manually enter phone numbers each time you use it. Apr 94

★★★ **Delrina FaxPro for Macintosh 1.0 (1.5.1), Delrina Corp., 408/363-2345, $129.** Fast, efficient fax software has an excellent address-book but also has some interface quirks and minor bugs. Feb 94

★★★★ **DOS Mounter Plus 4.0, Dayna Communications, 801/269-7200, $100.** File-transfer and

continues

Star Ratings

translation utility works with floppies, removable drives, and network volumes and supports wild cards in DOS extensions. Apr 94

★★★★ **EtherPeek 2.0.3 (2.0.4), LocalPeek 2.0.3 (2.0.4), TokenPeek 1.0 (2.0.3), AG Group, 510/937-7900, $495 to $995.** Priced at a fraction of the cost of dedicated hardware analyzers, these network analyzer tools give you better analysis with a friendlier interface. They're a worthwhile investment. Jan 94

★★ **The Internet Companion, The Voyager Company, 914/591-5500, $29.95.** Well-written, HyperCard-based electronic book offers much less information than others. While Internet access is available through the accompanying software, you get just a terminal-emulation screen. Dec 94

★★★★ **Internet Explorer Kit and Internet Starter Kit, Hayden Books, 317/581-3500, $29.95 each.** Well-written books and useful software combine to produce one of the best introductions to the Internet available for Macintosh users. Dec 94

★★★★ **Internet Membership Kit, Ventana Media, 919/942-0220, $69.95.** If you need access to the Internet, this book-and-software combination is a good package. The best part about it is its included preconfigured software. Dec 94

★★★★ **MacLink Plus/Translators Pro 7.5, DataViz, 203/268-0030, $149.** If your PC files are in archaic formats, you'll need this file-transfer and translation utility. It's a great option for most users, but it doesn't support removable drives or network volumes. Apr 94

★★★ **MicroPhone Pro 2.0, Software Ventures Corp., 510/644-3232, $295.** The new feature set of this communications package includes multiple sessions, faxing, TCP/IP networking, and more, but it's a mixed bag. Not all the features are well integrated, although some are innovations for which users will be grateful. Oct 94

★ **PowerShare Collaboration Servers, Apple Computer, 408/996-1010, $999.** Before this collaboration software will be ready for prime time, Apple needs to overhaul the complex Admin application, add serious diagnostic aids, provide comprehensive documentation, and offer knowledgeable technical support at a price less than that of the program itself. Aug 94

★★★★ **Silver Cloud 1.2 (1.2.1), AG Group, 510/937-7900, $495 to $1595.** If you are administrating a large network and are drowning in a sea of devices and zones, this network-management software will make your life simpler. Feb 94

★★★ **SITcomm 1.0 (1.0.1), Aladdin Systems, 408/761-6200, $120.** Inexpensive telecommunications software is fairly easy to set up and use, and will do well for people who use just one or two online services. Still, it lacks true scripting and has limited protocol options. Apr 94

★★★ **Snap Mail 1.0.1, Casady & Greene, 408/484-9228, $200 to $1440.** Software will put you on the electronic-mail trail more easily and more cheaply than any competing product, if you can live with some minor (but surprising) shortcomings. Jun 94

★★ **SoftPC 3.1, Insignia Solutions, 415/694-7600, $499.** While the speed of this Windows PC emulator is greatly improved, buying an add-in PC card for your Mac is more efficient. Mar 94

★★ **SoftWindows 1.0, Insignia Solutions, 415/694-7600, $499.** You can run Windows software on a PowerMac with this emulation software, but although it's a viable solution, you pay the price in terms of performance, compatibility, and actual cost. Aug 94

★★★★ **Timbuktu Pro 1.0 (1.05), Farallon Computing, 510/814-5000, $199 to $1999.** Terminal-emulation product is a must-have for in-house technical-support staff and for people who need direct connection to computer systems on a variety of networks. The major enhancements of this version are TCP/IP support for Macs and noticeably faster screen redraw. May 94

★★ **TrafficWatch II 2.0 (2.1), Neon Software, 510/283-9771, $495.** The price of this AppleTalk traffic monitor is closer to that of full-blown network analyzers that do much more, albeit with greater complexity. Without printing, alarms, triggers, or true multiprotocol support, this product misses the mark. Jun 94

★★★★ **VersaTerm 5.0 (5.04), Synergy Software, 215/779-0522, $195.** The price and feature set of this network terminal-emulation package make it a terrific value, in spite of its complex documentation and limitations. If you're looking for a fast path to Internet connectivity, this is it. Jan 94

★★★★ **White Knight 12.0, The FreeSoft Company, 412/846-2700, $139.** While this telecom software can be bewildering, it works impressively well. If you're willing to read the manual from cover to cover, the program may become your favorite telecom tool. Nov 94

DESKTOP PUBLISHING

★ **AboutFace 1.1.1 (1.1.2), Big Rock Software, 716/288-2860, $69.95.** Type-specimen generator has many serious deficiencies that need to be addressed. Jan 94

★★ **CheckPost 1.3, Working Software, 408/423-5696, $249.95.** Interface aside, this imagesetter-simulation software is generally disappointing. It can't automatically scale pages, it prints on a single sheet, and its error reporting is limited. Nov 94

★★★ **ClickBook 1.1, BookMaker Corp., 415/354-8161, $69.95.** If you need to create inexpensive booklets quickly and without hassle, this print utility that helps you format documents in double-sided booklet form is an excellent tool. Nov 94

★★★★ **FontChameleon 1.0.1, Ares Software Corp., 415/578-9090, $295.** Font utility introduces a new font-creation technology; it builds serif and sans serif fonts from a master outline file. It offers high-quality renditions of popular fonts, plus the ability to customize fonts. Sep 94

★★★ **FontMixer 1.0, Monotype Typography, 312/855-1440, $79.** Although a tad expensive for a one-trick pony, this font utility is a straightforward, relatively painless way to mix characters from different fonts to create composite fonts. Oct 94

★★★★ **Fontographer 4.0.4 (4.1), Altsys Corp., 214/680-2060, $495.** No other font editor does more or works better than this one. For the price of a few font families, it can give you a universe of unique faces. Oct 94

★★ **FotoTune 1.1 (1.13), Agfa Division of Miles, 508/658-5600, $395.** Color-management software has a capable engine, but it's not a complete color management system. Invisible tech support and poor documentation were only part of the problem. Apr 94

★★★★ **FrameMaker 4.0 (4.04), Frame Technology Corp., 408/433-3311, $895.** For such projects as long, structured documents—books, instruction manuals, and textbooks—this desktop publishing program is one of the best tools available. It's fast, well mannered, and a real time-saver. Mar 94

★★★★ **LaserCheck 1.0, Systems of Merritt, 205/660-1240, $199.** Imagesetter-simulation software can save you hundreds of dollars, and many hours, on imagesetting jobs by letting you use a laser printer to proof your work. Nov 94

★★★★ **PageTools 1.0, Extensis Corp., 503/274-2020, $129.** This collection of ten PageMaker Additions is packed with utility. Many users will find the PageAlign, PagePrinter, and PageRulers Additions alone worth the price, and the others frosting on the cake. Dec 94

★★★★ **Print Shop Deluxe 1.0 (1.1), Broderbund Software, 415/382-4400, $49.95.** Even the most ham-fingered can create professional-looking greeting cards, signs, banners, letterhead stationery and calendars with these desktop publishing templates and graphics. While it's not a substitute for a high-end program, it is easy to use and inexpensive. Apr 94

★★★ **ReadySetGo 6.0.2, Manhattan Graphics Corp., 914/725-2048, $395.** There's no strong reason not to use this destop publishing software if its tools meet your needs, but there's no compelling reason to choose it, either. Its low price is nice, but not enough. Oct 94

★★★★ **Tableworks Plus 1.05, Npath, 206/392-7745, $299.** Publishing utility adds a full table-editor to QuarkXPress and is a must-have for anyone doing even mildly complex tables. Jan 94

EDUCATION

★★★ **Creative Writer 1.0, Microsoft Corp., 206/882-8080, $64.95.** Graphics/page-layout/word-processor hybrid offers some terrific type effects, zany sounds, and bright graphics. While it doesn't teach kids to be better writers, it does encourage them to develop ideas and provides a fun vehicle to express those ideas creatively. Sep 94

★★★ **The Cruncher, Davidson & Associates, 310/793-0600, $59.95.** If you want to teach a child spreadsheet basics, this combination educational spreadsheet and business application will do the job. It's creative and easy to use, but slow. Aug 94

★★★★ **Grolier Multimedia Encyclopedia, Grolier Electronic Publishing, 203/797-3530, $395.** CD-ROM encyclopedia has excellent search capabilities, weighs much less than a shelf of books, and is lots of fun. Its timeliness and some hierarchical snafus were slight problems. Jul 94

★★★★ **How Computers Work, Time Warner Interactive Group, 818/955-9999, $43.60.** Graceful, well-integrated CD-ROM tutorial guides the curious through brief but helpful explanations of basic computer technologies. Jan 94

★★★ **MacGrade 1.5.5 (2.2.7), CalEd Software, 800/795-0641, $85 to $245.** Grade-book program has a straightforward, simple interface and clear documentation. Although there's room for improvement, it's easy to use and flexible. Feb 94

★★★★ **The Rosetta Stone, Fairfield Language Technologies, 703/432-6166, $395.** Foreign-language instruction on CD-ROM is a valuable educational tool and fun to use. Jan 94

★★★ **Small Blue Planet 1.2.1, Now What Software, 415/885-3432, $79.95.** Nicely integrated collection of beautiful Earth-from-space images on CD-ROM lacks many features of standard atlases and doesn't have a search function, but is endlessly fascinating. Jul 94

ENTERTAINMENT

★★★★ **Crossword Wizard 1.0, Cogix Corp., 415/454-7217, $49.95.** If you're a crosswork fan, this crossword-puzzle generator is a must. Although it's not perfect, the play mechanics are fantastic. Dec 94

★★★★ **Crystal Crazy, Casady & Greene, 408/484-9228, $49.95.** Ultraglossy, superpolished version of the classic Crystal Quest is challenging and fun without being overly difficult. Each level retains some old elements, and adds some new ones to keep you on your toes. Jun 94

★★★ **Firefall Arcade 1.0 (1.0.2), Inline Software, 617/935-1515, $49.95.** If you loved the classic video game Centipede, or are just looking for a fun shoot-'em-up, this arcade-style game will satisfy. Jun 94

★★★ **Hell Cab 1.0.1, Time Warner Interactive Group, 818/955-9999, $35.97.** Take a diabolical New York cabbie with a penchant for time travel, toss in the Empire State Building, add a few brainteasers, and you've got this engaging game on CD-ROM. It's slow and the arcade sections are hard to control, but it succeeds. Jan 94

★★★★ **Myst 1.0 (1.01), Broderbund Software, 415/382-4400, $59.95.** The smooth pacing of actions and sounds in this beautiful CD-ROM game give it a dreamlike quality. This is a game that's been polished until it shines. Mar 94

★★★★ **SimCity 2000, Maxis Software, 510/254-9700, $54.95.** In essence, your goal with this marvelous city-simulation software is to build a city and run it successfully. The game is fascinatingly complex, but it's simple to use, and the elaborate graphics are so lovely that it's even fun just to watch. Jun 94

★★★★ **Spin Doctor (1.0), Callisto Corp., 508/655-0707, $59.95.** In the tradition of the best Macintosh games, this game tests your wits and reflexes alike. It's part strategy game, part kinetic sculpture. Jun 94

FINANCE/ACCOUNTING

★★★★ **Andrew Tobias' TaxCut 1993, MECA Software, 203/255-1441, $79.95.** The free-form approach and flexible Help menus of this tax-preparation software make filling out your tax return a smooth, almost relaxing process. The only state versions available are California and New York. Apr 94

★★★ **ExpensePlus 1.0.1 (1.0.2), State of the Art, 714/753-1222, $139.95.** Software uses a Newton MessagePad to record expenses, then sends the data to a Mac to create and print expense reports. While it's a real time-saver, you'll need AppleScript expertise to modify the expense reports. Apr 94

★★ **Financial Competence 1.5, Competence Software, 603/435-5098, $99.** Business economics tutorial explains how financial statements are compiled and how they relate to each other. Jul 94

★★★★ **MacInTax 1993, Intuit, 602/295-3110, $69.95.** Tax-preparation software provides a reasonably detailed manual and a reliable, structured interface for building your tax return. Its inability to accept figures containing amounts in cents or round off to whole dollar amounts will frustrate some users. Apr 94

★★★ **MacInTax Tax Planner, Intuit, 602/295-3110, $29.95.** Software allows you to construct a five-year forecast of your tax liability, projecting tax figures through 1997 in a concise summary format. If you have a tax preparation program, you can do the same thing by creating alternative tax returns. Apr 94

★★★ **MacInTax Tax Savings Guide, Intuit, 602/295-3110, $19.95.** Simple, straightforward collection of tax tips and suggestions is designed to help you better understand your tax return and reduce your tax liability. Although strong in content, it doesn't allow you to copy and paste, export as a text file, or even print. Apr 94

★★★ **MacMoney 4.01, Survivor Software, 310/410-9527, $89.95.** Personal-finance software has new and improved features that will please longtime users, but it hasn't kept up with the leaders in the field and won't win many new converts. Jul 94

★★★ **Managing Your Money 6.0, MECA Software, 203/255-1441, $79.95.** Personal-finance program does a good if somewhat roundabout job of keeping track of your total financial picture. Although it isn't as easy to use as the competition, it excels in tax, investment, and financial planning. Jun 94

GRAPHICS

★★★★ **Adobe Illustrator 5.5, Adobe Systems, 415/961-4100, $595.** Despite slight speed disappointments, this draw program's upgrade is a bargain. It includes more than 200 tile patterns, 220 fonts, and the Acrobat Distiller and Exchange utilities. Sep 94

★★★★ **Aldus FreeHand 4.0 (4.0a), Adobe Systems, 206/622-5500, $595.** The new page-design and text-editing functions of this powerful draw program make it more than worth the price of admission. Aside from some bewildering interface elements, it's an outstanding program. Mar 94

★★★ **Canvas 3.5 (3.5.2), Deneba Software, 305/596-5644, $399.** Draw program offers two to three times as many features as any competing program, but our reviewer would prefer an interface that you can navigate without scrambling for the manual. Jan 94

★★★ **Collage 1.0.1 (2.0), Specular International, 413/253-3100, $399.** Image-compositing software allows you to combine and composite multiple RGB images stored in PICT, TIFF, and Photoshop 2.5 formats. While it's functional and indisputably easy to use, its oversights, including slow screen redraw with no interrupt option, are nearly as numerous as its benefits. Jul 94

★★★ **Dabbler 1.0, Fractal Design Corp., 408/688-5300, $99.** Art-education and paint software provides an excellent paint set with an appealing if slightly quirky interface, at a great price. Nov 94

★★★★ **DeBabelizer Lite 1.0 (1.1), Equilibrium Technologies, 415/332-4343, $129.** Terrific graphics utility converts graphics files from one format to another. It offers a choice selection of capabilities at a nice, slim price. Aug 94

★★★ **DesignWorkshop 1.0 (1.1), Artifice, 503/345-7421, $895.** The accessible interface and versatile modeling environment of this 3-D modeling software may be worth the fairly high price, particularly for architectural-design conceptualization. May 94

★★★★ **ElectricImage Animation System 2.0, Electric Image, 818/577-1627, $7495.** Although the price may seem incredibly high, this software, with its extraordinary animation and image-rendering capabilities, is worth every penny for cinematic-production professionals. Dec 94

★★★ **Infini-D 2.5.1 (2.6), Specular International, 413/253-3100, $695.** Serviceable 3-D graphics program has a wide range of modeling, rendering, and animation options, with a straightforward interface. Feb 94

★★★★ **IntelliDraw 2.0, Aldus Consumer Division, 619/558-6000, $129.** Wonderful general-purpose graphics package works well, does a great job of automating drawing tasks, and is straightforward. Despite its breadth of features, it always feels approachable. Sep 94

★★★★★ **Kai's Power Tools 2.0a (2.1), HSC Software, 310/392-8441, $199.** Phenomenally powerful suite of Photoshop plug-ins have an addictive quality typically associated with arcade games. There's no end to the automated effects you can generate and the artwork you can create. May 94

★★★ **Koyn Fractal Studio 2.02 (2.1), Koyn Software, 314/878-9125, $119.95.** Software lets you generate beautiful fractals of your own design. It's a reasonable choice if you are interested in Sierpinski triangles or naturalistic forms, but it's not an all-fractals-for-all-people program. Aug 94

★★★★ **KPT Bryce 1.0, HSC Software, 805/566-6200, $199.** For less than $200, you get a remarkable 3-D landscape–rendering program, a CD-ROM full of images, a slide-show utility, and even some screen-saver modules. Although the innovative, graphics-heavy interface can be confusing, this software is lots of fun. Dec 94

★★★ **Live Picture 1.5.5, HSC Software, 805/566-6200, $3995.** At its core, this image editor is a promising program rather rudely assembled atop some marvelous technology and burdened by an extremely high price tag. Though fast and blessed with all the benefits of a proxy-based system, its day-to-day functions leave plenty of room for improvement. Dec 94

★★★★ **LogoMotion 1.0, Specular International, 413/253-3100, $149.** Easy-to-use 3-D package is eminently affordable. It's a terrific program, both for creating flying logos and as an entry-level 3-D package for nonprofessionals. Nov 94

★★★★ **MacroModel, Macromedia, 415/252-2000, $1495.** This 3-D modeling software is a solid resource to have along when you venture out into 3-D space. The interface is elegantly simple, making the Mac's inner space a more pleasant place to work. May 94

★★★★ **MetaFlo', The VALIS Group, 415/435-5404, $595.** Graphics utility yields interesting visual effects with a minimum of fuss. It imparts elasticity to 2-D images, letting you push and pull collections of pixels while retaining the visual integrity of the image. Aug 94

★★★★ **MiniCad 5, Graphsoft, 410/290-5114, $795.** Excellent CAD software for the Power Mac offers major performance for its price. It's admirably easy to learn. Nov 94

★★★★ **Paint Alchemy 1.0, Xaos Tools, 415/487-7000, $99.** For the price, these plug-in graphics effects are a tremendous value that both casual users and professional artists can use to design a little chaos into their work. May 94

★★★ **PhotoMatic 1.01, DayStar Digital, 404/967-2077, $199.** AppleScript-based utility lets you automate tasks in Adobe Photoshop 2.5.1 or later. Although it's limited, it can relieve you of some mundane chores. Nov 94

★★★ **Pointillist, Pictor GraFX, 310/865-0495, $39.95.** Stereogram software creates images that look, at first glance, like random dots, but as you focus beyond the page, a 3-D image emerges from the pattern and appears to hover inches in front of the background. It's gleefully wacky. Jul 94

★★ **Ray Dream Designer 3.0.3 (3.1), Ray Dream, 415/960-0768, $349.** Although this 3-D-illustration software remains a price leader, unstable operation, misbehaving features, and sluggish performace are problems that need to be rectified. Jul 94

★★★ **ScanPrepPro 1.2, ImageXpress, 404/564-9924, $695.** Adobe Photoshop add-on automates the scanning and image-massaging process and produces good results, although the program is somewhat unstable. Nov 94

★★★★ **Scenery Animator 1.0.4 (1.1), Natu-**

continues

Star Ratings

ral Graphics, 916/624-1436, $149. Landscape rendering and animation software uses U.S. Geographical Survey data to create remarkably realistic 3-D representations of terrain. Its flaws are few, and our reviewer recommends it. Aug 94

★★★★ **Showplace 2.0 (2.1), Pixar, 510/236-4000, $495.** Adequate, entry-level, 3-D modeler is suitable for illustration and other graphic arts applications. This version offers improved access to MacRenderMan, one of the best renderers around, plus plug-in modeling tools. Apr 94

★★★ **StrataVision 3d 2.6.3 (3.1), Strata, 801/628-5218, $695.** 3-D program includes animation, and is a superior rendering tool and versatile modeler. It's a challenge to learn, however, as the interface is overly dense and sometimes sluggish. Feb 94

★★★★ **StudioPro 1.0 (1.1), Strata, 801/628-5218, $1495.** If you need a well-balanced, all-in-one 3-D modeling, rendering, and animation solution, this application is an excellent choice. Mar 94

★★★ **Terrazzo 1.0, Xaos Tools, 415/487-7000, $199.** Turning a random group of pixels into a geometric pattern may not be everyone's consuming passion, but this plug-in graphic-effects module has definite appeal for a select niche of fabric, graphic, and video designers. Nov 94

★★★ **Typestry 2.0 (2.1), Pixar, 510/236-4000, $299.** An approachable interface, animation support, and outstanding Renderman rendering technology make this 3-D type-renderer a popular choice. This version improves on the original, but still lacks canned positioning effects. Jun 94

★★★ **upFront 2.0, SketchTech, 612/379-9181, $299.** Capable modeler is something of an acquired taste. However, take the time to learn it and you'll find useful, if unconventional and demanding, tools that are well suited for architectural modeling. Jan 94

MATH/SCIENCE

★★★★ **Caduceus Science Review Macintosh Project 1.0 (1.1), Scientia, 617/776-3427, $250.** If you're taking the MCAT, you'd be nuts not to buy this interactive science review. With proper use, its 9MB of files are certain to improve your score. Apr 94

★★★★ **Chamber Works 1.0.2, OnScreen Science, 617/776-6416, $79 to $249.** Simulator for particle-physics events is the best introduction to particle physics yet produced, at a great price. Dec 94

★★★★ **CSC ChemOffice 2.0, Cambridge Scientific Computing, 617/491-6862, $995.** Comprehensive chemistry software is the Mac equivalent of software that seven years ago would have cost $200,000 and required an equally costly minicomputer. It's a winner. Feb 94

★★★★ **JMP 3.0, SAS Institute, 919/677-8000, $695.** This statistics software can be used for a wide range of biological, chemical, and physical-science investigations. New features include floating tool palettes, an annotation tool for data tables, and an experimental-design module. Sep 94

★★★ **Kekulé 1.1, PSI International, 410/821-5980, $495.** Science software reads scanned chemical-structure drawings and interprets them, giving both a diagram for checking interpretation accuracy and a formal string representation of the structure. Nov 94

★★★★ **LabView for Mac 3.0.1, National Instruments, 512/338-9119, $1995.** For large-scale, demanding projects in data acquisition and analysis, this scientific software is an unchallenged standard. Jul 94

★★★ **Maple V 3.0, Waterloo Maple Software, 519/747-2373, $795.** If you prefer to do your own programming and function creation, you'll benefit from this symbolic mathematics software's efficient use of your Mac's resources. This version hits most of the points on your symbolic-math wish list. Oct 94

★★★★ **MATLAB 4.1, The Math Works, 508/653-1415, $1695.** Relatively expensive numerical math software has added nearly 100 new graphics commands, improved its treatment of sparse matrices, and added commands for sound processing. Its toolboxes make it a first choice for many applied-science specialties. Nov 94

★★★ **QC Tools 1.0, Abacus Concepts, 510/540-1949, $245.** Quality-control tool kit for StatView appears to introduce a slight slowdown in program response, but is generally well designed, well documented, and suitable for quality-control neophytes as well as professionals. Jan 94

★★★★ **Resampling Stats 1.0, Resampling Stats, Inc., 703/522-2713, $225.** Innovative statistics software has proved itself to be a superior teaching tool in numerous classroom tests. If you have any interest in statistics, you should give this admirably straightforward approach careful consideration. Jun 94

★★★★ **SerePlot 2.12, Scientfic Visions, 301/593-0317, $135.** If you have piles of data and don't need animated, exploding bar-charts in 24-bit color, this scriptable plotting software should be part of your analysis tool kit. Jun 94

★★★★ **Spyglass Plot 1.0, Spyglass, 217/355-6000, $295.** This scientific-charting software is the first choice for serious large-set plot crunching. Oct 94

★★★★ **SuperScope II 1.25, GW Instruments, 617/625-4096, $1490.** Despite a relatively small instrument library, this laboratory data-acquisition software effectively covers a wide range of needs, and learning to use it won't become your life's work. Oct 94

★★★★ **Turing's World 3.0, CSLI Publications, 312/568-1550, $19.95.** Computer-science educational software lets you investigate some fundamentals in computing at an almost unbelievable bargain price. Feb 94

★★★★ **Visualization of Natural Phenomena, Telos/Springer Verlag, 408/249-9314, $59.95.** CD-ROM introduction to applying all aspects of computer graphics to scientific imaging covers all disciplines and offers definitive analysis of methods. No other source covers this much material, at this level of clarity. Jan 94

ORGANIZATION/PRODUCTIVITY

★★★★ **Arrange 2.0, Common Knowledge, 415/325-9900, $349.** If your needs fall beyond the usual calendar and address-book functions, this personal information manager is a strong contender. It now has more calendar functions and print options. Dec 94

★★★★ **DateBook & TouchBase Pro Bundle 4.0, Aldus Consumer Division, 619/558-6000, $89.99.** Personal information manager package is now easier to use and offers many new features. The excellent linking between contacts and calendar is the most significant feature. Sep 94

★★★ **DateView 1.0.1 (1.0.2), Advanced Software, 515/225-4163, $99.95.** If you're willing to sacrifice some features to get simplicity and speed, this calendar/to-do manager makes sense. It integrates with the contact manager, InTouch. Aug 94

★★★ **Dynodex for Macintosh 3.5, Portfolio Software, 802/434-6400, $69.95.** Although this program doesn't currently link to a calendar, it is an excellent contact manager. This upgrade has a few new features, improved performance, and an easier-to-use interface. Sep 94

★★★ **First Things First Proactive 1.1, Visionary Software, 503/246-6200, $149.** Capable scheduling program has some convenient features. It's worth a look if you don't have to share information with a contact manager. Nov 94

★★★ **Full Contact 2.01 (2.02), FIT Software, 408/562-5990, $169.** Personal information manager can handle with speed and style tasks that would choke other products, but frequently, using it feels like a full-time job. Aug 94

★★★★ **In Control 3.0.4, Attain Corp., 617/776-1110, $85.** Excellent to-do-list manager and outliner, coupled with a good calendar is a strong choice if you live and die by to-do lists. Oct 94

★★★ **Now Contact 1.0 (1.1), Now Software, 503/274-2899, $69.** This contact manager has some innovative features and could easily become the top address-book program for the Mac by adding some features, such as file reconciliation. Mar 94

★★ **Rae Assist 1.0.2 (1.5), Rae Technology, 408/725-2850, $99.** Although this personal information manager offers some fresh ideas, including automatic linking of company and contact information, it's too big and too slow. Jan 94

★★ **Souvenir 2.2, ComposeTel, 415/327-0744, $49.** While this contact manager is fast and simple, it's hard to recommend it when you can buy integrated contact managers and schedulers for about the same price. Dec 94

★★★ **TimeSquare 1.0, Team Building Technologies, 514/278-3010, $149.** Fast, flexible, network calendar program has lots of handy features, but it's missing a few as well, such as multiday events and label grouping. Aug 94

PRESENTATION TOOLS

★★★★ **Adobe Premiere 4.0, Adobe Systems, 415/961-4100, $795.** Video-editing software for the Power Mac remains as solid and reliable as previous versions, and also advances far and above its competitors with new and improved professional-level features. With the right hardware, it can give desktop-video editors broadcast-quality products with a minimum of compromises. Dec 94

★★ **Animation Master 2.0.5, Hash Enterprises, 206/750-0042, $699.** Although this animation software packs extraordinary power at a reasonable price, it's needlessly difficult to learn and prone to instability. Oct 94

★★★★ **Authorware Professional 2.0.1, Macromedia, 415/252-2000, $4995.** Multimedia-scripting and -presentation software lets you develop complex presentations with amazing speed. Although expensive, it's wonderfully done and will pay for itself in time saved. Feb 94

★★★ **Avid VideoShop 2.0, Avid Technology, 508/640-6789, $499.** QuickTime video-editing program shines in its intuitive, easy-to-use interface, although it may fall short on features for hard-core video professionals. Feb 94

★★★ **Deck II 2.1, OSC, 415/252-0460, $399.** AV Macs turn into digital-audio workstations with this software that enables you to record, mix, modify, and play back CD-quality sound. It doesn't include equalization features. Jun 94

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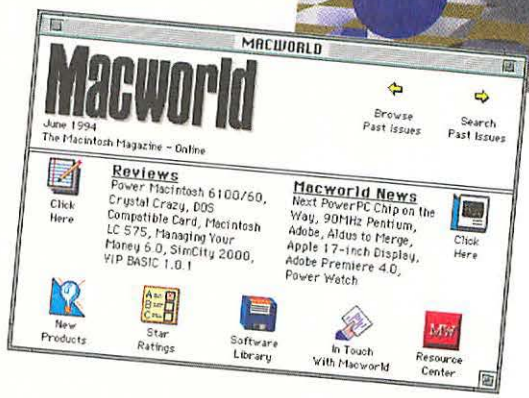

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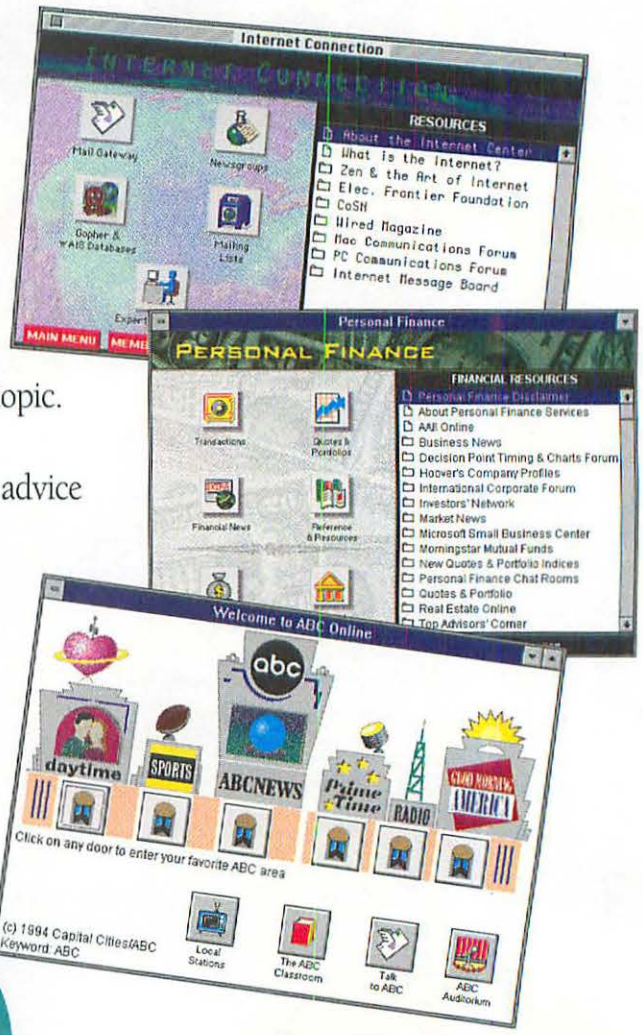

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★★ **Elastic Reality 1.0 (1.2), Elastic Reality, 608/273-6585, $349.95.** Exciting morphing tool can create professional-caliber results—if you can figure out how to use it. The needlessly convoluted interface and inadequate tech support make that a difficult task. Feb 94

★★★★ **FlipBook 1.0, S. H. Pierce, 617/338-2222, $89.** Animation printing utility lets users make flip-books (consisting of a series of printed images that, through application of an extremely technical thumb-and-forefinger method, appear to move) out of QuickTime movies, PICS animations, and Scrapbook files. Jun 94

★★★ **HyperCard 2.2, Apple Computer, 408/996-1010, $249.** Authoring tool strikes a good balance between power and ease of use, and its price is reasonable. It may not satisfy all your wishes, but it should keep you happily building stacks until the next version. Sep 94

★★★★ **Macromedia Director 4.0, Macromedia, 415/252-2000, $1195.** Although this multimedia program remains far from easy to use, this admirable upgrade increases the program's power and improves its interface. Multimedia professionals will continue to find it the best package available. Sep 94

★★★★ **Morph 2.0 (2.5), Gryphon Software, 619/454-6836, $239.** Easy to use morphing software is beautifully designed, with delightful new features, including the ability to morph QuickTime movies. Using it is as painless as morphing gets. Apr 94

★★ **MovieWorks 2.0.2, Interactive Solutions, 415/377-0136, $295.** With diligence you can get decent results with this all-in-one QuickTime-based multimedia package. But other entry-level programs make leaping into multimedia easier and more rewarding. Sep 94

★★★ **The Multimedia Workshop 1.0, Davidson & Associates, 310/793-0600, $79.95.** Children or adults can use this media-integration tool without big investments of either time or money. It's full of compromises, though, such as the inability to layer narration over music. Nov 94

★★★ **Passport Producer Pro 1.0 (1.1.2), Passport Designs, 415/726-0280, $995.** Superb, albeit quite expensive, media-integration package makes assembling even complex presentations surprisingly easy. Path animation is limited to entrances and exits. Apr 94

★★★★ **Persuasion 3.0, Adobe Systems, 206/622-5500, $339.** Users have plenty of new features to cheer about, including improved tool palettes, extensive charting options, and hypertext functions with this presentation graphics program's upgrade. But high memory and disk-space requirements are drawbacks. Sep 94

★★★ **QuickFlix 1.0 (1.1.1), VideoFusion, 419/891-1090, $149.** Approachable QuickTime movie making software lacks the high-end features of other programs but costs a whole lot less. Feb 94

★★★ **SoundEdit 16, Macromedia, 415/252-2000, $379.** Digital audio software supports 16-bit sound and has enough goodies to earn it a place in a multimedia producer's toolbox. But its lack of record-level controls limits its usefulness as a professional audio tool. Dec 94

PROGRAMMING

★★★★ **IDL 3.5, Research Systems, 303/786-9900, $1500.** In this shockingly powerful, compact, graphics-oriented, interpreted language, a single command is worth a page of C-language code. If you're an image processing professional, you should consider adding it to your tool kit. Oct 94

★★★★ **Object Master for Think C and C++, ACI US, 408/252-4444, $255.** Object-oriented development environment is full of goodies and will pay for itself in about a week due to increased programmer productivity. Apr 94

★★★★ **Smalltalk/V for Macintosh 2.0 (2.02), Digitalk, 714/513-3000, $495.** Object-oriented development system is viable for commercial projects, while Digitalk's customer support and documentation set a standard other vendors should emulate. Feb 94

★★★ **VIP BASIC 1.0.1 (1.0.3), Mainstay, 805/484-9400, $295.** Popular programming language lets programmers who know only BASIC get started producing real, if interpreted, Mac programs. It's a serious developer's tool, though it's not on the same footing as VIP-C. Jun 94

★★★★ **VIP-C 1.0.1 (1.5.1), Mainstay, 805/484-9400, $495.** If you've mastered the rudiments of C, this programming-code generator will let you code about ten times faster than you could using only an editor. Its real strength is in rapidly assembling smaller projects. May 94

UTILITIES

★★ **Apple Personal Diagnostics 1.0 (1.1), Apple Computer, 408/996-1010, $129.** In trying to make a hardware tool for the rest of us, Apple has come up short. This hardware-diagnostics utility has an uneven manual, some less than thorough tests, and a surprisingly unsatisfying interface. Nov 94

★★★ **AppleSearch 1.0, Apple Computer, 408/996-1010, $1799.** Although it has some rough edges, this product for archiving and retrieving text is highly useful. It presents retrieved information clearly and extracts text from documents in many formats. May 94

★★★ **Atticus Vista 1.0 (1.0.2), Atticus Software Corp., 203/348-6100, $69.95.** Control panel and application automatically catalog the disks you mount on the desktop. It has a few problems, including limited search options, but it can help bring order to disorganized disk collections. May 94

★★★★ **Automap Road Atlas for Macintosh 2.01 (2.04), Automap, 206/455-3552, $99.95.** Mapping software tells you how to get where you're going better than any other map or software our reviewer has seen. Although screen redraw is slow, it's worth it for the written directions and maps. Jul 94

★★★ **CD AllCache 2.0, CharisMac Engineering, 916/885-4420, $79.95.** CD-ROM accelerator improves access time by caching a CD's directory and putting its most frequently used data into RAM. Despite this software's limitations, most CD addicts will find the speed improvement worth the trouble. Sep 94

★★★★ **CD-ROM ToolKit 1.0.5 (1.1), FWB, 415/474-8055, $79.** Software accelerator can halve the time it takes to open files and search on a CD-ROM. The product supports a wide variety of formats and CD-ROM drives, but users should be aware that playback of QuickTime movies is often uneven. May 94

★★★★★ **Conflict Catcher II 2.1.1, Casady & Greene, 408/484-9228, $79.95.** Customizable, fast, and safe extension-management utility goes well beyond the basics. For Power Macintosh users, it even tells which extensions aren't written in native code and are likely to slow down Power Macs. Oct 94

★★★ **CryptoMactic 1.01, Kent Marsh, 713/522-5625, $99.** Security software offers fast Finder-level encryption and decryption with effective file removal. Although its simplest encryption algorithm isn't quite hacker-proof, it's worth considering. Feb 94

★★★ **DiskDoubler 4.0, Symantec Corp., 503/334-6054, $79.95.** In pure efficiency terms, this file-compression software is a winner, but it lacks many features of previous versions. Aug 94

★★★★ **DiskLock PB 1.0 (3.0), Symantec/Fifth Generation Systems, 503/334-6054, $99.** PowerBook security software balances robust security with simplicity and ease of use. It's harder to crack than most PowerBook utility collections' security features. Jan 94

★★★★ **DiskTop 4.5 (4.5.1), PrairieSoft, 515/225-3720, $99.95.** Organizing a crammed hard drive is a more manageable task with this simple but powerful file-management utility that lets you copy, move, rename, delete, and find files—without using the Finder. Jul 94

★★★ **The Disney Collection Screen Saver, Berkeley Systems, 510/540-5535, $49.99.** Mickey, Goofy, Peter Pan, Ariel, and other Disney favorites cavort around your screen with this screen saver that includes 16 different modules. Mar 94

★★★★ **Drive7 3.0, Casa Blanca Works, 415/461-2227, $79.95.** Highly recommended hard drive-formatting utility easily formats and partitions most drives and provides all the options you need. And within its limitations, its Mount Cache utility provides a real performance boost. Nov 94

★ **DriveTech 1.0, MicroMat Computer Systems, 415/898-6227, $59.95.** Without decent documentation or clearer error messages, this floppy-drive cleaning and diagnostic program is essentially a $60 floppy-drive cleaning kit. Since you can buy a cleaning kit without software for $10, that makes it a bad deal. Jan 94

★★★ **DupLocator 1.03, Midnight Software, 303/933-1013, $99.** For new Macintosh users who don't have a general file utility, this software that locates duplicate files, as well as performs basic file commands such as moving and renaming files, may be useful. Jan 94

★★★ **eDisk 2.0, Alysis Software Corp., 415/928-2895, $149.95.** Driver-level software compresses data read to your drive on the fly and automatically expands data read from your drive. It offers transparent compression. Dec 94

★★★★ **Icon Mania 1.0 (1.01), Dubl-Click Software, 503/317-0355, $69.95.** Delightful icon-editing utility comes with terrific tools for building new icons, including an outstanding thumbnail feature that builds custom icons from graphics files. Aug 94

★★★★ **MacTools 3.0, Central Point Software, 503/690-8090, $149.** Recovering trashed files is a snap with this utility package that fixes more disk problems than its competition. It includes disk-and-file maintenance, disk repair, virus protection, and backup. Mar 94

★★★★ **Maxima 3.0, Connectix, 415/571-5100, $99.** If you have more than 8MB of RAM, you can use some of it as a RAM disk, speeding up disk-based operations, with this inexpensive utility. Nov 94

★★★ **Open Sesame 1.02 (1.1), Charles River Analytics, 617/491-3474, $99.** Utility automates Finder operations, such as opening, without macros or scripts. It has an elegant interface, but people with strict work habits are more likely to find its suggestions worthwhile than are those who don't follow a routine. May 94

★★★ **OptiMem 1.4.1 (1.5.6f), Jump Development Group, 412/681-2692, $129.** Systemwide memory manager monitors RAM use and allocates RAM where it's needed. Mar 94

★★★ **PopupFolder 1.0 (1.5), Inline Software, 617/935-1515, $59.95.** Finder utility is so handy and easy to use, you wonder why it isn't built into the Mac's

continues

Star Ratings

system software. On the other hand, it's sluggish when readying pop-up menus for every folder. Aug 94

★★★★ **PowerAgent 1.1, SouthBeach Software Corp., 305/858-8416, $159.** You can revolutionize your Macintosh work with this agent program that manages scripts. It provides excellent support for FileMaker Pro, but unfortunately in many other mainstream applications scripting is difficult to implement. Nov 94

★★★★ **PowerMerge 2.0, Leader Technologies, 714/757-1787, $129.** Powerful file-management tool helps you keep individual files, folders, or entire volumes organized and up-to-date. This version lets you compare and launch documents, rename files, trash superfluous files, and lots more. Aug 94

★★★ **ProFiles 1.0, Dayna Communications, 801/269-7200, $129.** Unusual new utility lets you group related files and folders for quick access and actions such as making aliases, copying, turning sharing on and off, and more. The recommended RAM allocation of 1MB may be a problem for computers with limited memory. Aug 94

★★★★ **QuicKeys 3.0, CE Software, 515/221-1801, $139.** The simple, unintimidating interface of this macro-building utility allows you to build a set of useful shortcuts quickly. Mar 94

★★★★ **RAM Doubler 1.0.1 (1.5), Connectix Corp., 415/571-5100, $99.** Inexpensive system extension doubles available RAM for many Mac users. There are a number of requirements, however, including System 7, 4MB of physical RAM, and a 68030 board. May 94

★★★ **Redux Deluxe 2.0.2 (2.5.1), Inline Software, 617/935-1515, $79.95.** Easy to learn and relatively simple to use, this backup program has some powerful features, such as scripting, but it doesn't have a compression option. Jan 94

★★★★ **SAM 3.5.8 (4.0), Symantec Corp., 503/334-6054, $99.** Efficient, thorough virus-protection software slows down system start-up and application launching, but this program is a worthwhile investment for anyone who exchanges or downloads files. Mar 94

★★ **SCSI Director Pro 3.0.6, Transoft Corp., 805/565-5200, $99.** Utility provides simple, one-button hard disk formatting, but when doing some of the fancy tricks described on the program's box, the going gets rough and technical support costs $1.90 per minute. Sep 94

★★★★ **Square One 2.0, Binary Software, 310/449-1481, $74.** The slick design, flexibility, and straightforward interface of this file-launching utility make it a pleasure to use. Dec 94

★★★ **Stop & Go 4.0, Engram International, 415/455-1100, $69.99.** File-protection/relaunch utility uses a portion of your hard disk to save a snapshot of the data in your Mac's RAM. It's fast, and it relaunches files, applications, and extensions in a single, unified process, but it's unduly complicated. Oct 94

★★★ **Tempo II Plus 3.0.9 (3.0.9a), Affinity Microsystems, 303/442-4840, $179.95.** Very capable macro-creating utility may be daunting for novices but offers plenty of power for advanced users. Mar 94

★★★★ **TimesTwo 2.0, Golden Triangle Computers, 619/587-0110, $149.** This driver-level compression utility is transparent and robust. It caused no problems through a two-month course of testing, on a system with myriad utilities and system software tools. Mar 94

★★★ **UnderWare 1.0.1, Bit Jugglers, 415/968-3908, $59.95.** Inspired, silly fun for your Mac's desktop comes from a control panel that adds three features: a screen saver, desktop patterns, and animations that run on your desktop while you work. The price for this whimsy is mostly in disk space. Jun 94

★★★★ **Virex 5.0 (5.03), Datawatch Corp., 919/549-0711, $99.95.** The extremely fast, trouble-free performance of this software makes the task of guarding against computer viruses almost painless. Its speed puts it ahead of the pack. May 94

★★★★ **VirtualDisk 1.1a (2.0), Continuum Software, 206/695-8136, $79.** Rapid disk cataloging; fast, efficient label-printing; and an excellent disk-copy utility make this software a wonderful value. Jul 94

★★★ **Working Watermarker 1.02 (1.06), Working Software, 408/423-5696, $49.95.** Simple, useful system extension allows you to print or fax "watermarks" in the background of virtually any document. Although it has imperfections, it's earned a permanent spot in our reviewer's System Folder. Jan 94

VERTICAL MARKETS

★★★★ **Claire, The Personal Music Coach 1.0.1, Opcode Systems, 415/856-3333, $129.95.** Musicianship program teaches pitch and interval recognition, sight singing, and intonation. Although the interface is nonstandard, it's easy to learn. May 94

★★★ **ErgoKnowledge 1.0, Visionary Software, 503/246-6200, $395.** Despite a few shortcomings, this CD-ROM offers a good, basic review of office-computer ergonomics. Dec 94

★★ **MacInteriors 1.0 (1.2), Microspot, 408/253-2000, $129.** Correctly placing objects is unduly cumbersome in this interior-design software, but once you catch on to the program's quirks, it's useful. Feb 94

★★★★ **Mayo Clinic Family Health Book 1.2, IVI Publishing, 612/686-0779, $69.95.** Medical CD-ROM for home use deals with the full gamut of health-care topics, from AIDS to zygotes, although it doesn't include any reference to alternative therapies. Sep 94

★★★ **Mayo Clinic: The Total Heart 1.0, IVI Publishing, 612/686-0779, $59.95.** Cardiovascular health and related subjects are the topics of this medical CD-ROM for home use. Although it makes liberal use of drawings, photographs, and animations, video sequences would have been more effective. Sep 94

★★★ **MusicTime 2.0, Passport Designs, 415/726-0280, $149 to $249.** Music-notation program is geared for hobbyists and students. If your needs aren't complex, it may fit the bill, at a great price. Oct 94

★★★ **SAM-CD, Scientific American Medicine, 212/754-0550, $395.** Despite a few shortcomings, such as the poor interface for case simulations, this medical reference work—a popular series of publications covering topics in clinical medicine—should prove a worthwhile addition to any medical library. Sep 94

★★★★ **WillMaker 5.0, Nolo Press, 510/549-1976, $69.95.** Legal software quickly and easily automates the creation of wills, health-care directives and proxies, and final-arrangements documents. It offers excellent explanations, examples, and background. Jun 94

WRITING TOOLS

★★★★ **MacWrite Pro 1.5 (1.5 v2), Claris Corp., 408/727-8227, $249.** The clean, uncluttered interface of this low- to middle-level word processor is still one of its major assets. This upgrade adds support for QuickTime, PowerTalk, AppleScript, and more. May 94

★★★★ **OmniPage Professional 5.0, Caere Corp., 408/395-7000, $695.** In a historic first for OCR, this Power Mac software has an accuracy of 100 percent on good text samples. It does still make occasional baffling minor errors on real-world documents. Nov 94

★ **The Oxford English Dictionary, Oxford University Press, Electronic Publishing, 212/679-7300 ext.7370, $895.** CD-ROM dictionary contains 20 print volumes, including half a million words, but the flaws, omissions, unreliability, and unforgivably poor design are unbearable. Apr 94

★★★ **Random House Unabridged Dictionary, Random House Electronic Publishing, 212/572-2600, $179.** Comprehensive dictionary on CD-ROM works within any program and is good at guessing misspelled words. Although some functions don't work reliably, the quality and design of the software are better than those of other dictionaries on CD-ROM. May 94

★★★ **TextBridge 2.0, Xerox Imaging Systems, 508/977-2000, $99.** Optical character recognition software is impressive on good documents and can be trained and automated. You won't find that anywhere else at this price. Sep 94

★★★★ **WordPerfect for Macintosh 3.0 (3.0a), WordPerfect Corp., 801/225-5000, $495.** The innovative interface of this word processor uses context-sensitive button bars and expandable rulers to make innumerable features accessible with a click of the mouse. It's an accomplishment in ease of use. Mar 94

★★★★ **WriteNow 4.0.1, WordStar International, 617/494-1200, $119.95.** Tidy word processor's conservative use of memory (the application fits into a dainty 600K partition) and graceful interface will continue to win it fans. This version adds elegant table capabilities and several PowerBook-friendly features. Jun 94

★★★ **Writing Coach 1.0, WritePlace Software, 503/484-6380, $89.** If you'd like help with your writing, this writing-skills tutorial could be a great investment. Skillfully worded worksheets assist with planning, organizing, and revising. Dec 94

Hardware

INPUT DEVICES

★★★ **DrawingSlate, CalComp Digitizer Division, 714/821-2000, $395.** Digitizing tablet is a good, compact, low-cost implementation of pressure sensitivity, although the battery-operated stylus is a bit heavy. Jun 94

★★★ **Ear Phone Streamline AV, Jabra Corp., 619/622-0764, $169.** As a hands-free telephony tool—and a replacement for the PlainTalk microphone—this telephone/speech-recognition earpiece is a winner. Its biggest drawback is that you can't hear other Mac sounds, such as modem tones, when it's plugged in. Jul 94

★★★★ **FlightStick Pro for Macintosh, CH Products, 619/598-2518, $129.95.** The authentic look and feel of this joystick, along with well-conceived software, make it a nearly perfect desktop pilot's companion. Dec 94

★★★★ **Mac Keyboard Deluxe, MicroSpeed, 510/490-1403, $125.** If you're in the market for a new or replacement keyboard, this one, which is both smaller and lighter than Apple's Extended Keyboard, is worth considering. It has four ADB ports. Nov 94

★★★ **PenDirect ADB, FTG Data Systems, 714/995-3900, $398.** Input device lets you manipulate items on the Macintosh screen using a special stylus called a light pen. It works well, although it seems ergonomically inferior to a mouse for routine tasks. Mar 94

★★★ **TrakMate, Key Tronic Corp., 509/928-**

8000, $149. Input device integrates a trackball into a wrist pad. While the design is interesting, it's not for everyone. Feb 94

★★★ **Wacom UD-1212R, Wacom Technology Corp., 206/750-8882, $749.** Graphics tablet with pressure-sensitive stylus is easy to use and highly customizable, though it's incompatible with AppleTalk and AppleTalk Remote. May 94

MISCELLANEOUS HARDWARE

★★★★ **IX-4015 Color Image Scanner, Canon Computer Systems, 714/438-3000, $1169.** The price of this color flatbed scanner is competitive, and its speed and excellent bundled software make it easy to use and a good choice for the small office. If you can get by without legal-size scans, it should serve you well. Jul 94

★★★★ **AirNote 1.0, Notable Technologies, 510/208-4400, $349.** Remote-messaging service lets you originate alphanumeric paging messages from your own computer, eliminating both dictation charges and errors in translation. It's a very handy way to get into alphanumeric paging. Dec 94

★★★ **Apple PowerCD, Apple Computer, 408/996-1010, $400.** Beautifully designed portable CD-ROM drive offers impressive audio and Photo CD features, but it's too slow to satisfy. Jan 94

★★ **G-Vox, Lyrrus, 215/922-0880, $399.** Hardware-software guitar-instruction package lets your Mac "hear" the notes you play on your guitar. Although the hardware works well, the software has some basic problems and doesn't live up to the hardware. Apr 94

★★ **Macintosh TV, Apple Computer, 408/996-1010, $2079.** As a computer, this combination computer-television-CD player is sleek but slow. You can get faster performance and better expandability from several less-expensive Performa models. Apr 94

★★★★ **Mirror 800 Plus Color Scanner, Mirror Technologies, 612/830-1549, $999.** Add the NuBus JPEG board ($300) and easy-to-use 35mm transparency scanning module ($599) and you get a nifty—if slow—desktop scanning package for a reasonable price. Jan 94

★★★ **PowerPlate, Technöggin, 513/321-1777, $169.95 to $299.95.** Long-lived, external PowerBook battery packs let you work for three to five times as long as the usual PowerBook battery. Unfortunately, the System 7 power manager periodically alerts you that your battery is not charging and dims the screen. Mar 94

★★★ **RCD-202, Pinnacle Micro, 714/727-3300, $2495.** Writable CD-ROM drive is good for archiving data simply and inexpensively, but it's incompatible with many hard drives. Mar 94

★★★★ **SCSI Sentry, APS Technologies, 816/483-6100, $99.** Although the price of this terminator may seem steep, this device may well be the cure for SCSI woes. Our reviewer heartily recommends it. Sep 94

★★★★ **ThinPack, VST Power Systems, 508/287-4600, $199.95.** External battery pack for PowerBooks is compact, with a lightweight design. It comes with handy power-management utilities. Mar 94

★★★★ **TurboDialer, Advanced Software, 408/733-2364, $69.95.** Automatic telephone dialer is a well-executed product, except for occasional computer noise that seeps into phone conversations. If you constantly dial phone numbers that are stored in your computer, this product will save you time and energy. Jul 94

★★★★ **Yamaha YST-M10 Powered Monitor Speakers, Yamaha, 714/522-9240, $149.95.** Powered speakers have a good balanced sound and a great volume range at an outstanding price. Apr 94

MODEMS/NETWORK HARDWARE

★★ **Cooperative Adapter, Photonics Corp., 408/955-7930, $349.** The high cost of each unit, the limitations and restrictions inherent in diffuse infrared, and the extremely low cost of traditional LocalTalk adapters and cabling make this infrared network interface an expensive niche product. Dec 94

★★★★ **Cypress PhonePro 1.2 (1.4), Cypress Research Corp., 408/752-2700, $349 to $950.** By improving its integration with FaxPro and with PowerTalk and PowerShare, this powerful telephony software has greatly extended its business scope. May 94

★★★ **DaynaPort Pocket SCSI/Link, Dayna Communications, 801/269-7200, $299 to $369.** Inexpensive, lightweight SCSI-to-Ethernet connector works with both desktop Macs and PowerBooks and can use the Mac's ADB port as a power source. Nov 94

★★★★★ **EtherWave, Farallon Computing, 510/814-5000, $129.** If you need to expand your network at a reasonable price with minimal fuss, get this Ethernet transceiver. It includes a second jack that allows you to daisy-chain to another device through an additional 10BaseT line. May 94

★★★ **FastSwitch 10, Grand Junction Networks, 510/252-0726, $6250.** Switched Ethernet hub is a great solution for networks that handle large amounts of data traded peer-to-peer, but if your network consists of E-mail and a file server, you probably won't see much benefit in stepping up to switched Ethernet. Dec 94

★★★ **OneWorld Fax, Global Village Communication, 415/390-8200, $999.** Easy-to-use network fax product lets an office share fax-sending resources without dedicating a hard drive and CPU; however, it can't receive faxes and can't queue more than one fax document at a time from a single CPU. Aug 94

★★★ **Pocket EtherTalk Adapter, Xircom, 818/878-7600, $349 to 399.** All-in-one SCSI-to-Ethernet connector is lightweight and works with desktop Macs and PowerBooks. Nov 94

★★★★ **PowerPort Mercury/PB 500 Series, Global Village Communication, 415/390-8200, $399.** Top-notch fax modem is capable of exemplary fax and data communications performance. Nov 94

★★★ **Spectra-Com P192mx, Bay Connection, 408/270-8070, $199.95.** If you must have absolute portability and AC power isn't available, this pocket data/fax modem can do the job. It's not that much smaller than a regular desktop modem, however. Oct 94

★★★★ **SupraFaxModem 288, Supra Corp., 503/967-2410, $329.95.** This 28,800-bps fax modem is a very good performer, as good as or better than 14,400-bps modems, and the price of admission isn't terribly steep. Combined with fast, stable fax software and a good terminal program, it's hard to beat. Aug 94

★★★ **Watermark Message Central 2.0.2, High Tide Software, 510/704-9927, $499.** If you're willing to put in a lot of effort, you'll find this highly sophisticated voice-mail system supremely flexible. It includes a specially modified modem with voice chip, as well as fax software and telecommunications software. Jul 94

PRINTERS

★★★★ **Apple Portable StyleWriter, Apple Computer, 408/996-1010, $439.** Sleek, portable ink-jet printer weighs 4½ pounds and is a pleasure to use. It uses standard StyleWriter cartridges. Jan 94

★★ **Brother HJ-400, Brother International, 908/356-8880, $369.** Compact, 360-dpi ink-jet printer is fairly slow and does not allow background printing. Some large files require additional application memory to print correctly. May 94

★★★★ **Color StyleWriter Pro, Apple Computer, 408/996-1010, $629.** Color printer represents one of the best values in the inexpensive color-printing market. It's fast, produces nice-looking output, and has some good features, including a great way of handling color ink cartridges. Sep 94

★★★★ **DeskWriter 310, Hewlett-Packard, 800/752-0900, $379 to $455.** Versatile, low-cost ink-jet printer is a 4.3-pound, battery-powered portable. With its 60-page sheet feeder, it's also a great desktop printer; and with a $49 color print cartridge, it offers inexpensive three-color printing. Mar 94

★★★ **HP LaserJet 4ML, Hewlett-Packard, 800/752-0900, $1279.** Primarily for those of you who use a PC or work in a small, mixed-platform environment, this energy-efficient laser printer offers automatic port and language switching, and is a good buy. May 94

★★★★★ **LaserWriter Select 360, Apple Computer, 408/996-1010, $1599.** Low-cost, high-performance, 10-ppm printer is perfect for small LocalTalk or mixed networks. For bigger networks, consider buying more than one; they're more cost-effective than a 20-ppm printer. Apr 94

★★ **Notebook Printer II, Citizen America, 310/453-0614, $399.** If weight and size are your biggest concerns in choosing a portable printer, and you print primarily in black and white, this thermal-fusion printer may be a good choice. If speed is at all an issue, however, other options may be preferable. Jun 94

★★★★ **Personal LaserWriter 320, Apple Computer, 408/996-1010, $959.** If you've been holding out for a high-quality personal laser printer that's fast enough to share over LocalTalk, the small inconveniences of this 300-dpi printer are easily outweighed by its low price, good speed, and PostScript Level 2 support. May 94

★★★★ **PowerPrint 2.5, GDT Softworks, 604/291-9121, $149.** Ingenious hardware-software combo lets you print from your Mac to almost any PC printer. It supports over 1000 printers, ranging from aging dot matrix models to the newer color ink-jet and laser printers. Sep 94

★★★ **P-Touch PC, Brother International Corp., 908/356-8880, ext. 4307, $449.95.** Versatile label printer is easy to set up and use, and produces high-quality output. The cost per label is high, though, and the documentation is weak. Sep 94

★★ **QMS ColorScript Laser 1000, QMS, 205/633-4300, $7999.** Color laser printer succeeds in combining the versatility of monochrome laser printing with attention-getting color, but if you don't need to chase rainbows right away, you might wait and see if competition drives capabilities up. Jul 94

★★★ **Silentwriter 640, NEC Technologies, 508/264-8000, $825.** With 3MB of RAM, PostScript Level 2 support, and a 6-ppm engine, this printer is a capable performer. Generally, it represents hassle-free printing, but it doesn't handle single sheets of paper well. Jun 94

★★★ **Smart Label Printer Pro, Seiko Instruments, 408/922-5900, $299.95.** If you need to print only a few labels at a time, this label printer may be an expensive but good choice. It prints very quickly, and with excellent print quality. May 94

continues

Star Ratings

SYSTEMS/STORAGE

★★★★ **Alacrity PM 6100, KS Labs, 614/374-5665, $165.** Installing a clock booster is the quickest, easiest, and cheapest way to extract more power from Apple's entry-level Power Mac. **Oct 94**

★★★ **Conley SR2 RAID System, Conley Corp., 212/682-0162, $25,335.** While RAID technology is typically praised for its fault-tolerance rather than its speed, this high-performance storage system proves that you can have both. For critical tasks requiring redundancy and round-the-clock operation, this is one of the best Mac RAID systems shipping. **Sep 94**

★★★ **EtherDock, E-Machines, 408/541-6100, $699.** Heavy-duty Duo docking option is equipped with a full set of 11 ports, including an Ethernet port. The locking mechanism is alarmingly wobbly—although reliable enough to ensure a good connection. **May 94**

★★★ **Expert Pad PI-7000, Sharp Electronics Corp., 800/237-4277, $899.** Personal digital assistant features the advantages of the Newton, in a better industrial design and at a comparative price. If the battery lasted longer and the message network were implemented, the PDA revolution could begin. **Feb 94**

★★ **HP Optical Disk Library 10LC, Hewlett-Packard, 800/752-0900, $9495.** Optical jukebox may fill the need for 10 gigabytes of online storage, but its performance is poor, and the software lacks the features needed for adequate management. **Jan 94**

★★★★ **LC 575, Apple Computer, 408/996-1010, $1699.** For students and small-business professionals who want high power and the convenience of having everything integrated into one case, this 33MHz 68040 system is an ideal choice. **Jun 94**

★★★ **Newton MessagePad 110, Apple Computer, 408/996-1010, $599.** This is the personal digital assistant that Apple should have shipped in August 1993, with improved handwriting recognition, including deferred and letter-by-letter recognition. It also has more memory, longer battery life, and a more efficient design. **Aug 94**

★ **NuTek Duet, NuTek USA Corp., 408/973-8799, $2996.** Mac workalike is both a PC and a Mac in a single box, but because of many incompatibilities and problems, the Duet is not a computer anyone should consider using for serious work. **Feb 94**

★★★★ **OrangePC Model 200 Series, Orange Micro, 714/779-2772, $1139 to $3237.** If your goal is to get a Mac that runs Windows as fast as a PC, you can't get there from here. But to get business-level performance for day-in, day-out use, these PC coprocessor cards are probably your best choice. **Aug 94**

★★★★ **PLI Infinity 270 Turbo, PLI, 510/657-2211, $651.** This 270MB SyQuest drive is fast, reliable, and a very good product. The cost of the medium is competitive with that of optical drives. **Sep 94**

★★ **PowerBook 150, Apple Computer, 408/996-1010, $1449.** Fast, lightweight portable is minimalist in the extreme, with no video-out, ADB, Ethernet, or microphone. Unfortunately, the price is less minimalist, and most budget-conscious shoppers would be better off buying a used or discontinued model. **Dec 94**

★★★ **PowerBook 540c, Apple Computer, 408/996-1010, $4839.** The prestige PowerBook du jour, this sleek, curvy and futuristic-looking notebook makes a good computer for both on-the-road and in-the-office use. Its nonstandard battery, memory, and Ethernet ports are not ideal features, however. **Oct 94**

★★★★ **PowerBook Duo 270c, Apple Computer, 408/996-1010, 4/240 $3099.** Notebook computer meets all the demands of power users; it weighs less than five pounds, features a color active matrix display, and offers longer battery life. **Feb 94**

★★★★ **PowerBook Duo 280c, Apple Computer, 408/996-1010, $3759.** If you travel a lot, this subnotebook computer is hands down the best Mac to get. It offers close to the power of a Quadra 650. **Oct 94**

★★ **PowerBook Duo Dock II, Apple Computer, 408/996-1010, $969.** Apple has added Ethernet to this full-featured docking station, but installing NuBus cards is still absurdly difficult. If you don't need NuBus expansion, consider other options. **Oct 94**

★★★★ **Power Macintosh 6100/60, Apple Computer, 408/996-1010, base model $1819.** Given its price and performance, this Power Macintosh is hard to resist. When developers offer in PowerPC format the software that most business users run daily, this should be a system that will give you power to spare. **Jun 94**

★★★★★ **Power Macintosh 7100/66, Apple Computer, 408/996-1010, $2899.** Midrange Power Mac makes an outstanding workstation whose power should last for several years. The price is nothing to take lightly, but this system delivers every dollar's worth. **Aug 94**

★★★★ **Power Macintosh 8100/80, Apple Computer, 408/996-1010, $4249.** While this system doesn't quite offer the excellent price/performance ratio

continues

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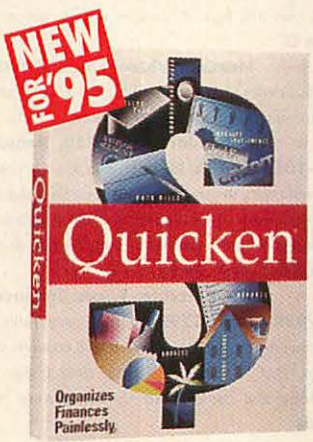

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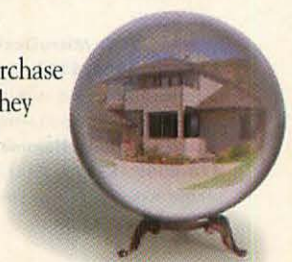

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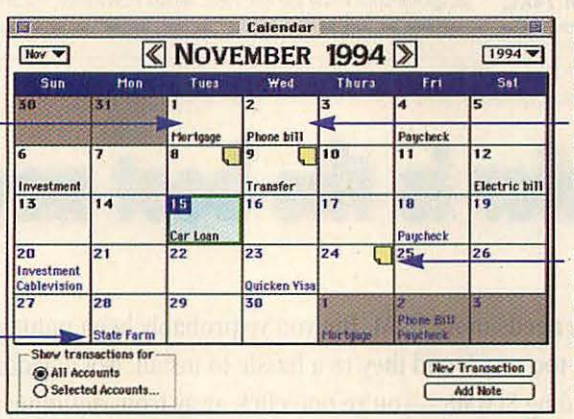

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Star Ratings

of the other available Power Macs, you should consider it if you're a high-end user moving your work over to RISC-based computing. Aug 94

★★★ **Power Macintosh Upgrade Card, Apple Computer, 408/996-1010, $699.** Current 33MHz 040 machines will get the best bang for the buck with this card, which is a less expensive upgrade path than a standard motherboard replacement. However, other Macs won't realize as much of a performance gain. Oct 94

★★★★ **Quadra 605, Apple Computer, 408/996-1010, 4/80 $979.** Never before has Apple offered so much performance for so little money. The performance and price of this 040-based machine match those of an entry-level 486SX-based Windows PC. Mar 94

★★★★ **Quadra 630, Apple Computer, 408/996-1010, $1279.** Fast, inexpensive, expandable 33MHZ 68040 machine may be the last 680X0-based desktop Macintosh, but it's one of the best entry-level Macs ever. Nov 94

★★★ **SCSI MicroDock, Newer Technology, 316/685-4904, $175.** Tiny Duo docking station is just under 41/2 ounces and barely 5 inches long. It adds only an ADB port and a SCSI port—but both are useful. May 94

★★★★ **SledgeHammer2000FMF, FWB, 415/474-8055, $3179.** RAID drive is both fast and inexpensive. Although it can be a bit noisy when accessing data, it's a good deal. Apr 94

VIDEO/DISPLAY

★★★ **Apple Macintosh Display Card 24AC, Apple Computer, 408/996-1010, $1579.** 24-bit accelerated graphics card offers a satisfactory price/performance ratio, although it can't switch resolutions from the keyboard. Oct 94

★★★ **Apple QuickTake 100 for Macintosh, Apple Computer, 408/996-1010, $749.** If you're in the market for a medium-quality, digital color camera that costs less than $1000, this is the best deal around. But if you're not in a hurry, you may want to wait until some of the camera's more obvious problems, such as its fixed-focus lens and lack of a zoom option, are ironed out. Jul 94

★★★★ **FlexCam, VideoLabs, 612/988-0055, $595.** Small, unobtrusive desktop video camera has a flexible gooseneck for positioning. Dec 94

★★★ **Intellicolor Display/20, Radius, 408/434-1010, $2399.** Although with its exceptional brightness and clarity this monitor would be a fine addition to any designer's desk, the included Intellicolor software, which lets you control the settings of your display, doesn't offer much added value. Apr 94

★★★ **L-TV Portable, Focus Enhancements, 617/938-8088, $299.** Sturdy, inexpensive, external TV-converter plugs into your Mac and converts video output to NTSC. It provided a crisp, clean image, but mild flickering and conspicuous shimmers were persistent. Aug 94

★★★ **L-TV Pro NuBus, Focus Enhancements, 617/938-8088, $399.99.** NuBus card converts your Mac's RGB video signal to NTSC so you can use your Mac with a TV or VCR. It supports a wide range of Macs, but the image has some flicker and distortion, despite flicker-filtering software. Aug 94

★★★ **The Presenter Plus Mac/PC, Consumer Technology Northwest, 503/643-1662, $429.** Small, external TV-converter supports output to television from most Macs with built-in video. It does a barely passable job of providing a stable image. Aug 94

★★★ **QA-350 LCD, Sharp Electronics Corp., 800/237-4277, $2495.** At less than half the cost of a typical active matrix LCD panel, this passive matrix projection panel offers an economical alternative for presenters who don't need multimedia capability. Jul 94

★★★★ **Radius LeMansGT, Radius, 408/434-1010, $2499.** Fast, 24-bit accelerated graphics card has automatic 30-bit CLUT calibration and can switch resolution on the fly via a pop-up menu. Oct 94

★★ **RasterOps Horizon 24, RasterOps, 408/562-4200, $1999.** This 13-inch 24-bit accelerated graphics card is slower than anticipated and overpriced. The ROM can, however, be upgraded via software. Oct 94

★★★ **Simply TV, E-Machines, 408/541-6100, $439.** Easy-to-install video card plugs snugly into a PDS slot, and allows you to use your Mac with a television for display. The image is impressively flicker-free, but the resolution is limited to 256 colors. Aug 94

★★★★ **SuperMac Spectrum Power•1152, SuperMac, 408/541-6100, $1399.** Fast, relatively inexpensive, 24-bit accelerated graphics card can switch resolutions from the keyboard and offers zoom and pan options. Oct 94

★★ **Tornado Graphics Card, Mirror Technologies, 612/832-5622, $699.** Inexpensive 24-bit accelerated graphics card has zoom and pan options but is relatively slow. Oct 94 m

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4 1/2 MACUSER

Macworld readers voted RAM Doubler as the "Most Promising Newcomer" in this year's World Class awards. Macworld's editors gave it an Editor's Choice award. In fact, in almost every review of RAM Doubler you'll see praise similar to what MacUser wrote: "may well be the best investment you'll make this year."

MACWORLD MW EDITORS' CHOICE

But don't take their word for it. Try it yourself. RAM Doubler is only $99 SRP with a 30-day money back guarantee. Get RAM Doubler wherever great software is sold.

CONNECTIX

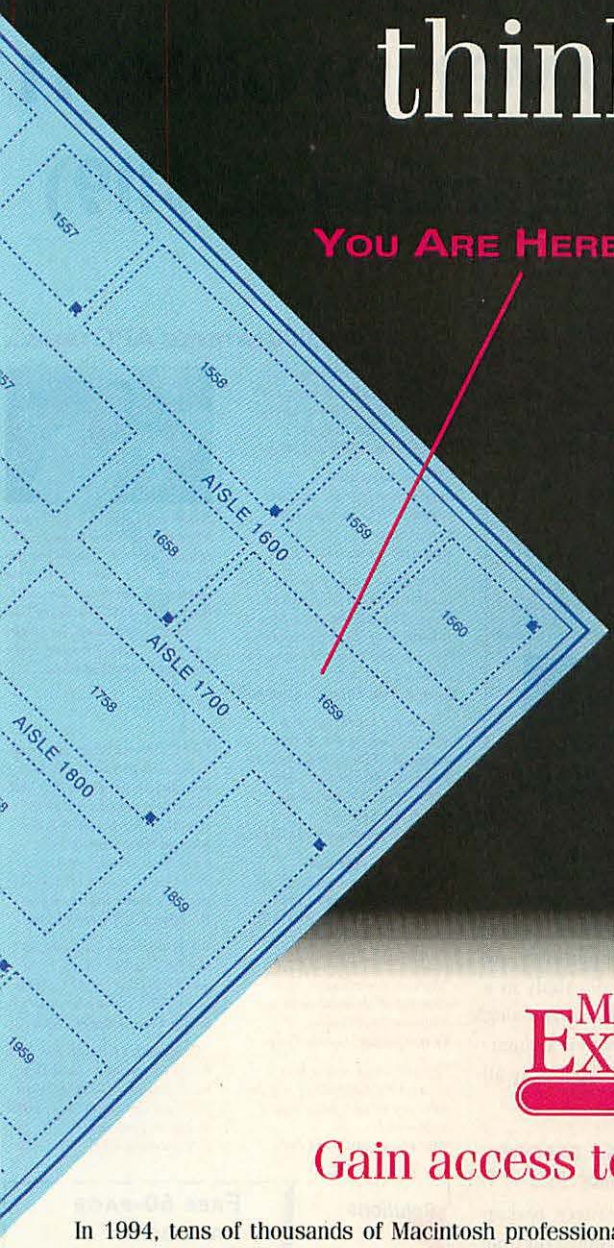
800-950-5880 ext. 270

2600 Campus Drive, San Mateo, CA 94403
415-571-5100 • FAX: 415-571-5195
AppleLink/AOL: CONNECTIX

©1994 Connectix Corporation. RAM Doubler requires Mac II (with PMMU) or better (68030, 68040 or PowerPC microprocessor) with 4 MB RAM & System 6 or 7. RAM Doubler is not compatible with Mac LC, Classic, Plus, SE or PowerBook 100. RAM Doubler is a trademark of Connectix. All other trademarks are the property of their respective holders.

Circle 192 on reader service card

If you think you just get some floor space, think again.



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IT'S NOT IF. IT'S WHEN.

486, Pentium, PowerMac...

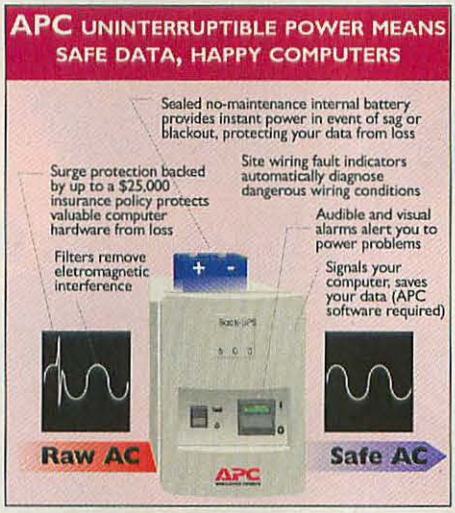
No matter how fast your PC is, it can't outrun a power problem

(Get Uninterruptible...starting at $119)

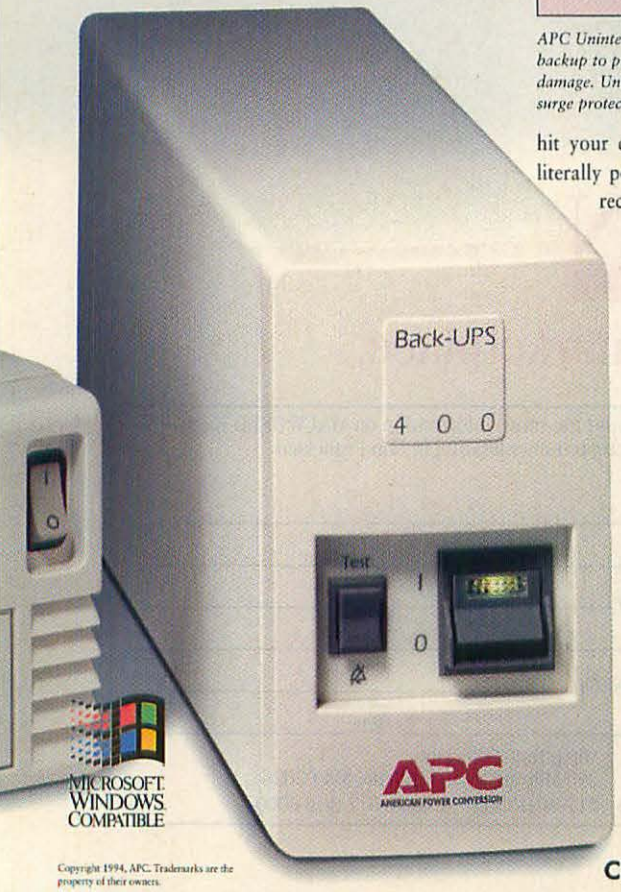
Just don't have the time for power problems on your PC? Don't worry. They'll always make the time for you. It's not if a power problem will occur, but when. Due to household appliances, poor wiring, bad weather or even other office equipment, power problems are as inevitable as death and taxes.

IN THE NEXT THREE MONTHS, MORE THAN 30,000,000 PCs WILL BE HIT BY POWER PROBLEMS...

In fact, you have better odds of winning the lottery than of escaping the sting of power problems on your PC. One study discovered a typical PC is hit over 100 times a month, causing keyboard lockups, hard drive damage, and worse. And since sags and blackouts represent more than 85% of power problems likely to hit your computer, standard surge suppressors are literally powerless to protect you. And a study in a recent *PCWeek* showed that the largest single cause of data loss is bad power, accounting for almost as much data loss as all other causes combined.



APC Uninterruptible Power Supplies provide instant battery backup to protect your data from loss and your hard drive from damage. Units are even backed by up to $25,000 in lifetime surge protection insurance.



PROTECT YOURSELF BEFORE YOU KICK YOURSELF...

Get instantaneous battery backup power from an APC Uninterruptible Power Supply and prevent keyboard lockups, data loss, and hard disk crashes. Surge protection performance is even backed by up to a $25,000 Lifetime Equipment Protection Guarantee.

Ask for APC at your computer reseller today or call for your FREE handbook.

PC MAGAZINE UK EDITORS' CHOICE

Starting at just $119, an APC UPS is serious protection no serious computer user should be without.

PC World Top 20 Upgrade

"Don't take chances...get the ultimate protection... from APC."--PCWorld

Circle 59 on reader service card

OVER 3,000,000 SATISFIED APC USERS...

"This is the best computer related purchase I have ever made! Has saved me hours of re-programming..."
Carol Irvine, Wizard Assoc.

"We reduced our maintenance costs the first year by 50% in repairs of equipment."
Valentin Gonzalez, Pfizer

"Our server was running a project when it lost power... messed up all the data files. It took four days to recover. But we don't worry anymore since we got APC..."
Tony Chen, DeAnza Systems

"We were working on a state bid when the power went off. APC saved the day and year and future...about 800 pages of data saved thanks to APC."
Ravi Iyer, Software Galleria

"A power surge did significant damage to all of our systems except those protected by APC. The APC units were undamaged..."
C. Jeffrey, C. Jeffrey Eng.

"APC has virtually eliminated downtime in our corporate network..."
Kurt Roemer, Searle Corp.

"Power went out while processing payroll! If not for APC we would have had a walkout!"
Suzi Higgason, OSI Inc

Home office user Don Traux knows first hand about APC reliability: "It ought to be against the law to buy a computer without an APC Back-UPS 250. I recently had a direct lightning hit right outside the house...my computer never blinked."

"APC lets me sleep better at night. How much would you pay to get back that one file you worked all day to complete for the boss who gets on the plane at 8:00 a.m? You should assume that you'll buy a UPS, not that it's some luxury item."
R. Morella, Westinghouse

"A power surge wiped out the FAT tables on all PC's not protected by APC. Now have APC installed on all..."
Craig Post, Comm. Tech.

"Before I purchased the UPS I had to put in at least two hard drives at $1000. With APC products...no new hard drives in two years!"
S. Foreman, LSP

FREE 60-PAGE HANDBOOK

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Streetwise Shopper

SPECIAL HARDWARE AND SOFTWARE BUYING OPPORTUNITIES

Selected and edited by Charles Barrett

The following listings include both time-sensitive promotions and open-ended offers being sponsored by Macintosh vendors and their resellers. Each listing indicates which products have been awarded a star rating in *Macworld's Reviews* (products rated ★★ or lower are not eligible for inclusion), have been selected as an **Editors' Choice**, or have won a **World-Class** award. In some cases, the editorial evaluation quoted is for an earlier product version. The ◐ symbol indicates that the product is Power Mac related. Except where otherwise indicated, prices given are suggested retail prices.

When placing an order, please mention that you saw the offer in *Macworld*. Should any problems arise, contact the *Streetwise Shopper* editor by fax (415/442-0766), phone (415/978-3241), or mail (*Macworld*, 501 Second St., San Francisco, CA 94107).

Vendors and resellers desiring to have products and services included in this section are encouraged to contact the *Streetwise Shopper* editor with particulars.

BUNDLES

Aldus Program + TypeTwister 1.0 Adobe is including a free copy of its $29.95 TypeTwister (Jan 95 ★★★★) with any of its Aldus Consumer Division software programs—including Aldus Home Publisher, SuperPaint, Paint & Publish, IntelliDraw, Art Explorer, and DateBook & TouchBase Pro. Offering 242 custom colors, TypeTwister works through the Clipboard, OLE, or Apple events to provide a selection of designs for cutting and pasting, and tools for custom alteration of text. *Offer expires 1/15/95.*

DAT Autoloader + ◐ Retrospect Remote 2.1 MicroNet Technology is including Dantz Development's $449 software (Sep 93 ★★★★ for Retrospect Remote 2.0) for backing up and archiving three remote Macintoshes and one server with its new $4495, 48GB DAT Autoloader, which is based on DDS-2 digital audiotape technology. Call 714/453-6100 for product and reseller information.

◐ Fractal Design Dabbler + Wacom ArtPad Fractal Design and Wacom Technology are offering a $239 ArtPak bundle consisting of Fractal's $99 natural-media draw and paint application for beginners (Nov 94 ★★★ for 1.0) and Wacom's $199 ArtPad graphics tablet, which includes the cordless, batteryless, pressure-sensitive UltraPen stylus and driver. Estimated street price for the bundle is $175. Call 800/922-6613 for nearest reseller.

LaserPress 1200 + ◐ Adobe Photoshop 3.0 Xante Corporation is including Adobe's $895 image-editing program (Jan 95 ★★★★) free of charge with its $7495 LaserPress 1200, a 1200-by-1200-dpi laser printer with PostScript Level 2 software and full-bleed 11-by-17-inch capabilities. The 1200 is based on the 8-pages-per-minute Toshiba TN-7270 print engine and includes Ethernet. Call 800/926-8839 for more information. *Offer expires 12/31/94.*

MasterFinder 1.2.1 + Trash Picker Olduvai Corporation is offering its $79 Trash-management utility free of charge when customers purchase its $149 MasterFinder disk-management utility (Nov 92 ★★★★) for $9.95. MasterFinder allows complete control and manipulation of files and folders on any hard drive, CD-ROM drive, or floppy disk. Trash Picker saves time and disk space while improving file security. Call 800/548-5151 to order. *Offer expires 3/31/95.*

QuickMail Internet Access Kit CE Software is offering a 10-user kit consisting of its $649 (10-user) QuickMail electronic-mail system (Jan 95 ★★★ for QuickMail 3.0), StarNine Technologies' $595 (10-user) MailLink Remote dial-up Internet gateway, plus a free one-month subscription and ten hours of connect time to UUNET's Alternet Unix-to-Unix Copy Protocol service for $799. Existing QuickMail customers can purchase MailLink Remote at significant discounts from CE Software: $279 (10-user pack), $399 (20-user pack), $899 (50-user pack), and $1199 (100-user pack). Call 800/523-7638 for more information.

SIDEGRADES/UPGRADES

◐ 4th Dimension 3.2; ◐ 4D Server 1.2 ACI US is offering these $59 and $149 upgrades—3.2 to owners of 4th Dimension 3.1, and 1.2 to owners of 4D Server 1.1—free of charge. Call 408/253-3366 for more information, or fax 408/252-7215 for order form. *Offer expires 1/31/95.*

Adobe Premiere 4.0 + LogoMotion 1.5 The MacZone is offering an upgrade (regularly $79) to version 4.0 of Adobe's video-editing software (Dec 94 ★★★★), together with Specular International's LogoMotion for creating 3-D animations of text and logos (regularly $108.98), to registered Premiere 3.0 users for $124.98. Call 800/436-0606 to order bundle #94151. *Offer not to expire before 12/31/94.*

SPECIAL DISCOUNTS/REBATES/OFFERS

Art Textures and Backgrounds, Vol. 1 FotoSets is offering this $349 collection of 100 royalty-free photographic art textures and backgrounds in Kodak Photo CD format for $249. Each image comes in five file sizes, from 128 by 192 pixels to 2048 by 3072 pixels. Call 800/577-1215 for more information and to order. *Offer expires 12/31/94.*

ClarisImpact 1.0 Claris is offering this $399 integrated business-graphics program (Jun 94 ★★★★) discounted to $149. Registered owners of MacDraw Pro, MacDraw II, ClarisDraw, ClarisWorks, or compatible graphics and charting applications can purchase/upgrade for $99. Call 800/544-8554 for more information. *Offer expires 12/31/94.*

eWorld Apple Computer is offering new subscribers to eWorld ten free hours on the service and is waiving the first month's $8.95 subscription fee. The $2.95 U.S. and Canadian hourly surcharge during business hours (6 a.m. to 6 p.m.) is being waived during this trial period. A basic subscription includes two free hours of evening or weekend usage each month. Each additional hour costs $4.95. Call 800/775-4556 (in Canada, 800/877-8129). *Offer expires 2/15/95.*

MultiSync 2V Monitor NEC Technologies is offering a $25 ($30 in Canada) rebate on this color monitor, which has a maximum noninterlaced resolution of 1024 by 768 up to 70Hz and comes with a three-year limited warranty. The estimated selling price is $355. Call 800/632-4636 for more information. *Offer expires 12/31/94.*

Portrait/15 Pivot; ◐ PrecisionColor Pivot Portrait Displays Labs (PDL) is offering a $100 rebate to customers who purchase either of these 15-inch monitors between 11/7/94 and 3/15/95. Both the PDL Portrait/15 Pivot (which also runs on Windows computers) and the Radius PrecisionColor Pivot are optimized for displaying applications in 256 colors at resolutions up to 1024 by 768, at noninterlaced refresh rates of up to 75Hz. The estimated street price (including rebate) for either monitor is $699. Call 800/858-7744 for more information. *Offer expires 3/15/95.*

Radius Graphics Accelerator Cards Radius is offering rebates of up to $500 on the following cards if purchased between 10/15/94 and 12/31/94: $150 each for LeMansGT, SuperMac Thunder/24, and SuperMac Thunder II GX•1152; $250 each for SuperMac Thunder II GX•1360 (Apr 94 "Fast Track to 24-Bit Color" **Editors' Choice**) and SuperMac Thunder II GX•1600. Rebates are doubled when Radius's new $1099 Photoshop-specific, digital signal processor accelerator, PhotoEngine, is purchased on same invoice. Call 800/227-2795 for nearest dealer. *Offer expires 12/31/94.*

SPSS 6.1 SPSS is offering this $695 cross-platform statistical package for $495. Version 6.1 adds a spreadsheet-style interface and features integrated charting. Upgrades from version 4.0 are $199 plus $99 per additional program module, with a module cap of $298. Call 800/543-2185 to order and for more information. *Offer expires 12/31/94.*

Type On Call 4.0 Adobe Systems is offering its $99 Type On Call—a locked CD containing more than 2000 Adobe typefaces available for round-the-clock purchase—bundled with $475 worth of software, for a discount of $49. Type On Call also includes a choice of any 2 typefaces from 8 new selections, 30 of Adobe's most popular Type 1 typefaces, Adobe Type Manager (**1993 World-Class**), and the Adobe Type Reunion font-menu organizer. Every type package purchased from Type On Call is 35 percent off list. This offer applies only to orders placed through Adobe's *Font & Function* type catalog, which can be obtained by calling 800/445-8787. *Offer expires 1/31/95.*

◐ WordPerfect 3.1 WordPerfect Corporation is offering this $395 native Power Mac version of its word processor (Mar 94 ★★★★ for version 3.0; Aug 94 for version 3.0a) for $99 ($59 for an upgrade). It comes with its $99 Grammatik 5.0 grammar and style checker, Macintosh Easy Open, and Data Viz's compound filter for Microsoft Word. Call 800/321-4566 for more information. *Offer expires 1/31/95.* m

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January 3, 1995 • San Francisco • 11am–3pm

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☐ **Yes! I'd like to attend Macworld Vision '95. Enclosed is my check in the amount of _____ for _____ tickets.**

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Clip and mail to: Macworld Vision '95 • 501 Second St. • San Francisco, CA 94107 or fax to 415/442-0766 no later than December 19, 1994.

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Please answer these questions so that we may better serve you.

A. Including yourself, approximately how many people are employed at your entire work-site (i.e., employees in your office, building, or cluster of buildings)? (Check one.)

- 01 ❑ 1000+
- 02 ❑ 999 - 100
- 03 ❑ 99 - 25
- 04 ❑ Under 25

B. Which of the following computers are installed at this entire work-site? (Check all that apply.)

- 05 ❑ Apple Workgroup Servers/ Mac Quadra-series
- 06 ❑ Mac Centris-series/II-series/LC III/ Performa 600/450/SE 30
- 07 ❑ Mac LC/LC II/Performa 430/405/ 400/200/Classic-series/SE/Plus/ 512K/128K/Portable
- 08 ❑ Mac PowerBook-series/Duo-series

C. What is the total number of Macs installed at this entire work-site? (Check one.)

D. For how many Macintosh computers within this entire work-site do you have purchase involvement for products and/ or services? (Check one.)

	C	D
500+	❑ 09	❑ 15
499 - 100	❑ 10	❑ 16
99 - 50	❑ 11	❑ 17
49 - 10	❑ 12	❑ 18
9 - 1	❑ 13	❑ 19
None	❑ 14	❑ 20

E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)

- 21 ❑ Initiate/Determine need for product/capabilities/features
- 22 ❑ Evaluate, recommend, or approve brands/models
- 23 ❑ Evaluate, recommend, or approve purchase source
- 24 ❑ Authorize purchases

F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)

- 25 ❑ $1 million or more
- 26 ❑ $999,999 – $500,000
- 27 ❑ $499,999 – $100,000
- 28 ❑ $99,999 – $50,000
- 29 ❑ $49,999 – $10,000
- 30 ❑ Under $10,000

G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)

- 31 ❑ Business software (Word processing, spreadsheet, database, etc.)
- 32 ❑ Graphics/publishing software
- 33 ❑ Monitors/displays
- 34 ❑ Printers/scanners
- 35 ❑ Networking/communications hardware and/or software
- 36 ❑ Multimedia/AV hardware and/or software
- 37 ❑ Mobile computing products (PowerBooks, peripherals, software, etc.)

H. What is your primary job function? (Check one.)

- 38 ❑ Computer Reseller/VAR/VAD
- 39 ❑ MIS/DP/IS/Network Management
- 40 ❑ Engineering
- 41 ❑ R&D/Scientific
- 42 ❑ Corporate/General Management
- 43 ❑ Accounting/Finance
- 44 ❑ Marketing/Sales/PR/ Communications
- 45 ❑ Art/Design/Creative Services

Thank You!

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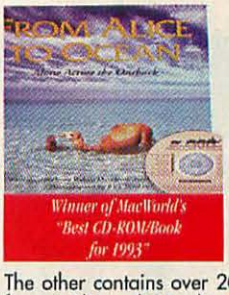

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SyncMaster™ 14GL

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- Tilt-swivel base

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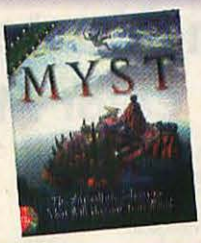

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Publisher: Broderbund

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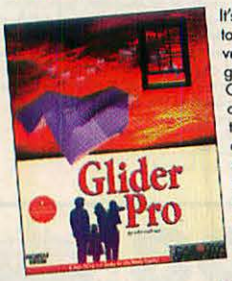

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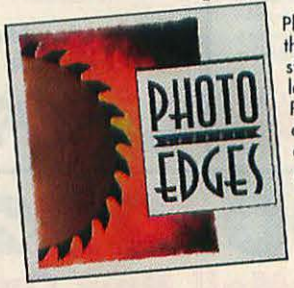

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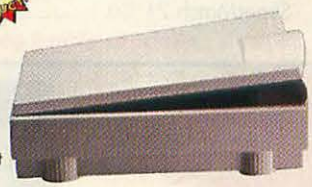

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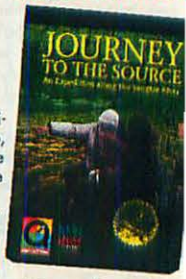

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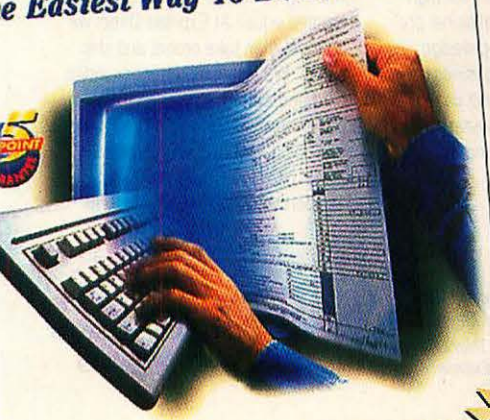

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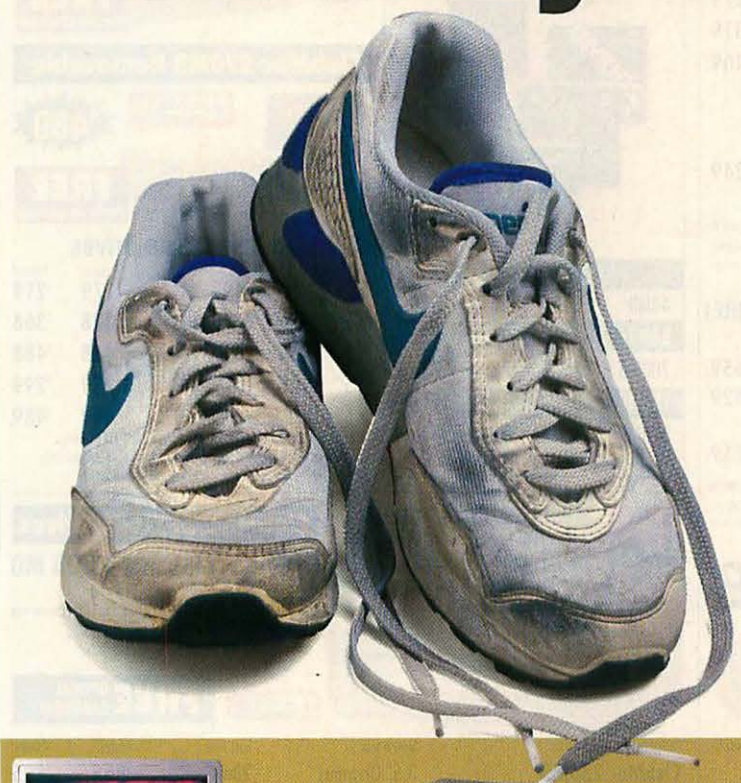

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Designed for high-performance CD-ROM applications, multimedia development and networks, the NEC MultiSpin 4Xe features a data transfer rate **FOUR TIMES** faster than single speed CD-ROM readers (600KB/sec) and a 220ms access time. You can get information faster, see smoother animation and video, and keep network traffic flowing freely. The NEC MultiSpin 4Xe includes a Mac interface, tutorial CD, and driver software.

$499

			with ClubMac CD bundle
ClubMac Dual-Speed	320ms access time, 300KB/sec transfer rate	$199	$299
ClubMac Quad-Speed	220ms access time, 600KB/sec transfer rate	$439	$539
NEC MultiSpin 2V	(available in gray) 320ms access time, 300KB/sec transfer rate	$249	$349
NEC MultiSpin 3Xp Plus	240ms access time, 500KB/sec transfer rate	$399	$499
NEC MultiSpin 4Xe	220ms access time, 600KB/sec transfer rate	$499	$599

NEC MultiSpin CD-ROM Readers carry a TWO Year Warranty.
ClubMac CD-ROM Readers carry a 30-Day Money Back Guarantee and a ONE Year Warranty

FEATURING

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The ClubMac Removables are designed to give you superior performance in all notebook and desktop computers requiring a removable expandable storage subsystem for multimedia, desktop publishing, and other data-intensive imaging applications in your Macintosh system.

30 DAY

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ClubMac 44MB Removable

ClubMac 200MB Removable

ClubMac 270MB Removable

ClubMac Removable Drives

		Internal	External
5.25" ClubMac 44MB	Includes FREE Formatted Cartridge	$179	$219
5.25" ClubMac 88MB		$328	$368
5.25" ClubMac 200MB		$448	$488
3.5" ClubMac 105MB		$259	$299
3.5" ClubMac 270MB		$449	$489

All drives include SCSI Director formatting software, ONE FREE Cartridge, necessary cables for "plug-and-play" and documentation. All SyQuest drives include a 30-Day Money Back Guarantee and TWO Year Warranty.

MACWORLD MW EDITORS' CHOICE December 1994

Best Low-Cost Solution

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ClubMac OPTICAL Drives

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ClubMac 1.3GB MO

- 39ms average seek time
- 5.0MB/sec synchronous data transfer rate
- 3,000 RPM rotational speed
- 80,000 hours MTBF

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Optical Drive	Size/Model	Seek Time	Internal	External
ClubMac 230MB	3.5" Olympus	28ms	$865	$895
ClubMac 650MB	5.25" Sharp	40ms	$1269	$1299
ClubMac 1.3GB	5.25" Sharp	39ms	$1969	$1999
MaxOptix Tahiti III 1.3GB	5.25" 1.3GB	19ms		$2499

ClubMac Opticals include ONE cartridge, 30-Day Money Back Guarantee and a ONE Year Warranty (Olympus Optical includes a TWO Year Warranty)

OPTICAL MEDIA					
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2.0GB	ClubMac DAT	DDS	60m, 90m	$739	$789
2-4GB	ClubMac DAT/DC	DDS-DC	60m, 90m	$899	$949
4.0GB	ClubMac DAT/2	DDS-2	60m, 90m, 120m	$949	$999
4-8GB	ClubMac DAT/2DC	DDS-2DC	60m, 90m, 120m	$1049	$1099

MEDIA	4mm 60m $10	4mm 90m $12	4mm 120m $25	Exabyte EX-HC2000 $35

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ClubMac CD Bundle

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VideoVision Studio 2.0

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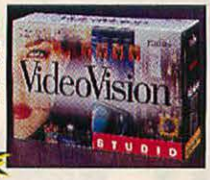

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Real-time capture of 60 fields/sec, full-motion video and audio to disk, supports 30 frames/sec with video capture up to 640 x 240, hardware JPEG compression.

SAVE OVER 60% BEST BUY

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The Radius IntelliColor Display/20e delivers unrivaled command of your desktop, from on-the-fly resolution switching to state-of-the-art color temperature control. Combined with Radius' IntelliColor software, it allows you to emulate 3 lightning conditions and user-adjustable color temperature, so you get more accurate color representation.

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PrecisionColor Display/17 (0460)	$959
PrecisionColor Pivot (0353)	$799
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$2319*

$1359**

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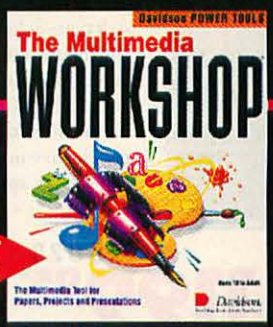

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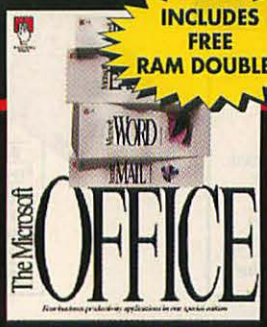

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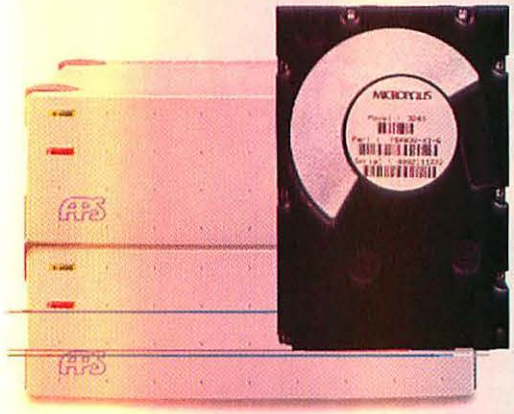

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APS MS 4.0

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Regulates SCSI Line Voltage	✓
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LED Activity Indicators Diagnostic Tool	✓
Easy Installation: Takes Seconds	✓

Need two Gigs?

Get the APS D 2.0 internal for only $1,199.95!

The APS D 2.0 delivers seek times as low as 9.6ms and transfer rates as high as 3.2MB per second. As an extra bonus the APS D 2.0 provides exceptional performance in both AV and non-AV applications.

APS D 2.0

$1199.95*

APS HARD DRIVES

For your Mac or Power Mac

Model	Capacity	Internal	SR2000
258MB - 2040MB			
APS Q 270[2] Maxtor 7290 mechanism	258MB	$189.95	$289.95
APS Q 540[2] Quantum 540 mechanism	516MB	279.95	379.95
APS I[mr] 1.0[5] IBM 0662 mechanism	1003MB	599.95	699.95
APS D 1.0[5] DSP 3107 mechanism	1020MB	699.95	799.95
APS Q 1080[2] Quantum 1080S mechanism	1029MB	599.95	699.95
APS I[mr] 2.0[5] IBM 0662 mechanism	1920MB	1099.95	1199.95
APS ST 2.0[5] Seagate ST 12550N Barracuda	2040MB	1399.95	1499.95
2047MB - 8673MB			
APS D 2.0[5] DSP 3210 Mechanism	2047MB	$1199.95	$1299.95
APS MS 4.0[5] Micropolis 3243 mechanism	4075MB	2499.95	2599.95
APS MS 4.0AV[5] Micropolis 3243AV mechanism	4075MB	2569.95	2669.95
APS ST 4.0[5] Seagate ST 15150 mechanism	4294MB	2499.95	2599.95
APS MS 9.0[5] Micropolis 1991 mechanism	8500MB	3599.95*	3799.95
APS MS 9.0AV[5] Micropolis 1991AV mechanism	8500MB	3699.95*	3899.95
APS ST 9.0[5] Seagate ST410800N mechanism	8673MB	3799.95*	3999.95

Internal drives for Quadra 800 and Centris 610 available.
DaTerm™ patent pending
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1-5 Denotes length of manufacturer's warranty
* External Case is Special Full Height Only
Full Height cases include SCSI Sentry FREE!
* Internal Price Listing

POWERBOOK DRIVES

Model	Capacity	Internal	LW Pro 630	Companion II AC/DC
APS T 340[1]	324MB	399.95	399.95	549.95
APS T 520[1]	500MB	499.95	549.95	649.95

SR 2000 UPGRADE KIT

The Perfect Home for your 3.5" Drive.
APS SR 2000 Upgrade Kit $199.95

Award-winning SR 2000 Upgrade comes with a detailed install guide and a step by step installation video!

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APS MO Drives

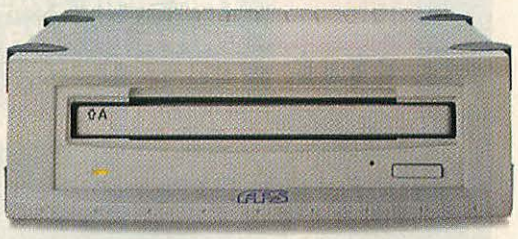
Only APS brings you the best of both worlds; amazing deals and top SCSI performance with Digital Active Termination™

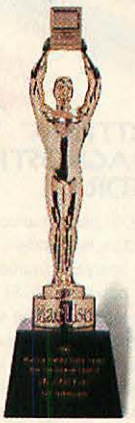
Magneto-optical technology is the simple, ultra-reliable, infinitely expandable data storage solution, and APS offers two rock-solid MO drives at unbeatable prices. Choose the affordable APS 230 MO and pack nearly 230MB of data onto one nearly corruption-proof cartridge the size of a floppy disk. The APS 1.3Gig MO offers the same data security in "Extra-Large." Both come with built-in DATerm™ Digital Active Termination and APS's proven support.

APS 230 MO

Internal configuration

$799.95





"In the fiercely competitive world of the humble desktop hard drive, nobody sweats the details more than APS. Elegant design, quality components, and rock-solid construction distinguish the compact APS SR 2000 Case."
— *Editors of MacUser*

THE APS ADVANTAGE

- 30-Day MBG
- Toll-Free Support
- Awesome Warranties
- Factory Direct Quality
- Rapid Repair Return
- 24-Hour Product Sales

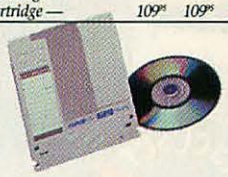
LEGENDARY PRODUCT SUPPORT APS TECHNOLOGIES

MAGNETO OPTICAL

Model	Internal*	SR 2000
APS 230MB MO[1]	$799.95	$899.95
APS 1.3Gig MO[1]	2009.95	2109.95

All MO Drives Include 1 FREE Cartridge

MO Media (unformatted)	*1-4*	*5-19*	*20+*
128MB cartridge —	*$35.95*	*$34.95*	*$29.95*
230MB cartridge —	*45.95*	*44.95*	*39.95*
1.3Gig cartridge —	*109.95*	*109.95*	*104.95 (1024KB/s)*



APS 1.3Gig MO

Internal configuration

$2009.95

AMAZING VALUE!

APS DAT **$799.95**

CD ROM

Model	SR 2000
APS T 3501	$499.95
APS T 3401	$399.95

POWERBOOK STUFF

APS SCSI DOC w/ PowerMerge Lite — $39.95

Palm-Sized 25–30 PowerBook SCSI Adapter that includes a docking adapter for PowerBook and termination power indicator. Receive Power-Merge Lite Free with every APS SCSI DOC!

APS SCSI BOY — $19.95

Rugged Palm-Sized 25–30 PowerBook SCSI Adapters

APS PowerBalls *(Original 4 Pack)* — $9.99.95

Color Set I: yellow, orange, green and hot pink.

APS PowerBalls *Color Set II* — $15.99.95

Color Set II: blue, red, purple, and the eight

Same day shipping for personal checks (Restrictions apply)

Visa, MasterCard, Discover, American Express: No Surcharge.

- 30-day money-back guarantee • (Excluding opened software) Your risk is the cost of shipping.
- Drive-for-Drive Repair or Replacement Warranty • The warranty length is denoted by the superscripted number next to each drive model. APS will, at its discretion, replace or repair products found to be defective according to the terms of the product's warranty.
- All prices and specifications are subject to change without notice.
- Refused orders subject to restocking fee.
- Hard drives include brackets, cables, cords and LEDs required for operation with the specified Macintosh -where applicable. All hard drives from APS Technologies come preformatted with Apple's System 7.0.1 software, at least 9 MB of compacted publicly-distributable software, and APS Technologies' APS POWER TOOLS SCSI formatter/hard disk partitioner.
- All external drive products and cases come with a premium 25 x 50 SCSI cable. Companion II drives, (not cases) include a 25x50 SCSI cable with SCSI BOY.
- International customers must pay for all shipping charges.
- Toll-free technical support as needed. Regular hours are 8 am to 8 pm Monday thru Friday, 9 am to 5 pm Saturday, Central Time.

SYQUEST

Model		SR 2000
APS SQ 5110c2	44/88MB†	$429.95
APS SQ 52002	200MB††	499.95
APS SQ 31051	105MB	329.95
APS SQ 32701	270MB	499.95

† Does not format 44MB cartridges
†† Does not format 44MB & 88MB cartridges
All SyQuest Drives Include 1 FREE Cartridge

SyQuest Media	*1-4*	*5-19*	*20+*
SQ-400 (44MB) cartridge	*$59.95*	*$58.95*	*$57.95*
*IO-44 (44MB) cartridge***	*49.95*	*48.95*	*47.95*
SQ-800 (88MB) cartridge	*79.95*	*78.95*	*77.95*
*IO-88 (88MB) cartridge***	*69.95*	*68.95*	*67.95*
SQ-2000 (200MB) cartridge	*89.95*	*87.95*	*86.95*
SQ-310 (105MB) cartridge	*59.95*	*57.95*	*56.95*
SQ-327 (270MB) cartridge	*69.95*	*68.95*	*67.95*

Prices listed are for unformatted media.
*** Indicates SyQuest compatible cartridges*

DAT

Model	Capacity*	Internal	SR 2000
APS DAT[2]	1.8-2G on 90m tape	$749.95	$799.95
APS HyperDAT[1]	8-10G on 120m tape	949.95	999.95

**Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.*

Maxell DAT Tapes	*1-4*	*5-19*	*20+*
60-Meter	*$9.95*	*$8.95*	*$7.95*
90-Meter	*11.95*	*10.95*	*9.95*
120-Meter (DDS-2)	*22.95*	*21.95*	*20.95*
3M DAT Tapes	***1-4***	***5-19***	***20+***
60-Meter	*$9.95*	*$9.90*	*$8.90*
90-Meter	*11.95*	*11.90*	*10.90*

All APS DAT Drives Include Retrospect by Dantz & 1 FREE DAT Tape

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All APS Drives Are Power PC Mac Compatible!

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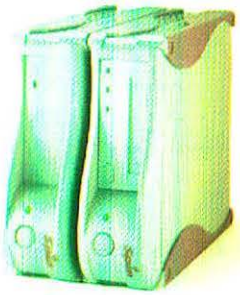
APS Technologies

Circle 62 on reader service card

THE SMARTTERM™ ACTIVE DIAGNOSTIC TERMINATOR

SmartTerm™ is a SCSI performance upgrade that adds active termination to any SCSI chain. While analyzing impedance and termination, it optimizes SCSI performance and data integrity. On line status indicators let you monitor signal quality. Improvements over other designs include gold-plated connectors for high quality signals, and internal power. Get SmartTerm and put an end to SCSI insanity!



Pictured with hard drive

SPIN DAT DRIVES

Don't wait for a disaster! Back up your valuable data with a Spin DAT drive. Spin DATs feature WangDAT mechanisms, known for performance and reliability. With its 2 GB capacity, the 3100 is a low cost solution for individual Macs. The 3200 compression DAT archives up to 5 GB, perfect for file server backup. The 3400 DDS/2 drive stores up to 8 GB at an astounding 28 MB/per minute!* Great for archiving large audio, video and graphics files. All DAT drives include SurfGuard™ for easy complete backup.

*Reported DAT capacities will vary depending on tape length, type of data, and method of data compression

Spin 3100 (7 MB/per min.) **$799.00**
Spin 3200 (14 MB/per min.) **$979.00**
Spin 3400 DDS/2 (28 MB/per min.) .. **$1149.00**

SPIN SYQUEST DRIVES

Cartridge sold separately

SyQuest 44 MB **$199.00**
SyQuest 5110C 44/88 MB **$299.00**
SyQuest 200 MB **$409.00**
SyQuest 105 MB **$279.00**
SyQuest 270 MB **$429.00**

GET YOUR MEDIA OVERNIGHT!

44 MB cartridge **$55.00**
88 MB cartridge **$69.00**
200 MB cartridge **$79.00**
105 MB cartridge **$56.00**
270 MB cartridge **$65.00**
Optical 3.5 in. cartridge **$35.00**
DAT 90 meter (4 mm) Tape Cassette **$17.00**

MacUser RATED 4½ OCTOBER 1994

MacUser RATED 4 OCTOBER 1994

THE SPIN 1021: "THE FASTEST DRIVE IN THIS CATEGORY (1 GB–1.6 GB)... A KILLER."

THE SPIN 2149: "THE SECOND FASTEST DRIVE (1.7 GB–2.8 GB CATEGORY)... AND COSTS LESS."

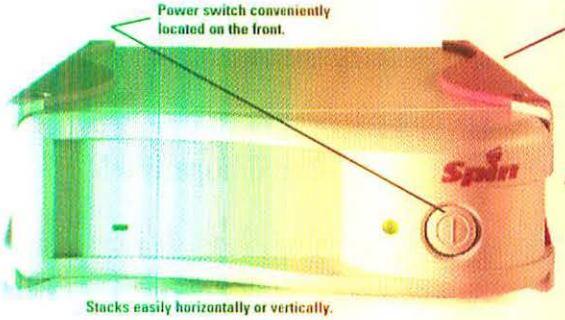
SPIN DEC DRIVES

Obviously, MacUser Labs was suitably impressed with our high performance drives. Better yet, these kind words were written before Spin introduced its latest innovations. Like the stackable Tornado enclosure with our exclusive DCR Active Termination™, RAIDLine! disk array software included with each drive, and RedLine! software that pushes the drives to new extremes. If speed, features, and a great price are what you need, buy the drives that leave the competition in the dust.

Spin 1021	1.0 GB	**$699** (Int.)	**$799** (Ext.
Spin 2149	2.1 GB	**$1199** (Int.)	**$1299** (Ext.

ORDER DIRECT:

THE NEW SPIN TORNADO ENCLOSURE



SPIN HARD DRIVES (includes SurfGuard Backup Software)

Capacity (Model)	Access	Internal	Torna
QUANTUM DRIVES			
270 MB (LPS270S)	12	$195	$29
340 MB (LPS340S)	12	$279	$37
540 MB (LPS540S)	12	$329	$42
1.08 GB (Emp 1080)	12	$699	$79
DIGITAL DRIVES			
1.0 GB (DSP-3107)	9.5	$699	$79
2.1 GB (DSP-3210)	9.5	$1199	$129
MICROPOLIS DRIVES			
1.0 GB (M4110AV)	8.5	$759	$85
1.7 GB (M2217AV)	8.5	$999	$109

Best deal around!

OVERNIGHT SHIPPING FOR AS LITTLE AS $5.00!

PRODUCTS AND DELIVERY YOU CAN COUNT ON.

At Spin Peripherals, we deliver the best storage products available. Because that is our business, we do not want inflated and unnecessary shipping charges to interfere with your satisfaction. As part of our commitment, we will ship any order to you overnight for just $1.00 per pound, with a $5.00 minimum. Except, of course, unless your shipment is over 21 pounds – then your price per pound goes *down*. No headaches, no asterisks, no fine print.

Oh, and there is no need to tip the courier. Enjoy.

SYQUEST MEDIA OVERNIGHT: INEXPENSIVE AND FAST.

Order your genuine SyQuest Cartridges from Spin Peripherals, and we will deliver up to five cartridges overnight for just $5.00!

SPIN AV DRIVES

Today's performance-hungry applications need drives that can keep the pace. Enter the Micropolis AV drives, optimized for maximum performance in applications like QuickTime, high-resolution scanning, and video capture. Built with enhanced thermal recalibration, AV drives add a new level of insurance that incoming data is complete. Housed in our Tornado enclosure with DCR Active Termination, and bundled with RAIDLine! disk. Array software and RedLine! driver software, these drives will get the whole picture.

Spin 1.0 GB AV	$759 (Int.)	$859 (Ext.)
Spin 1.7 GB AV	$999 (Int.)	$1099 (Ext.)

1-800-215-9200

Capacity (Model)	Access	Internal	Tornado
AGATE DRIVES			
1 GB (ST12550N)	8	$1679	$1779
POWERBOOK			
127 MB (Quantum GLS 127)	17	$239	–
80 MB (Toshiba MK2326)	12	$499	–
AND WHILE THEY LAST...			
Quantum (Powerbook) 2.5" 80 MB (GLS 80)			$99
Toshiba (External) 2x CD-ROM Drive (XM3401B)			$399
NEC (External) 2x CD-ROM Drive (CDR84)			$349

RAIDLINE ARRAY SOFTWARE

FREE WITH HARD DRIVES OVER 1.0 GB!

Striping for Performance. RAIDLine doubles your throughput, writing to 2 drives simultaneously. Striping (RAID Level 0) provides unparalleled speed for all applications, including digital video and PhotoShop®.

Mirroring for Insurance. RAIDLine can create redundant disks automatically, so that your data is always safe. Mirroring (RAID Level 1) is perfect for server applications and your valuable files.

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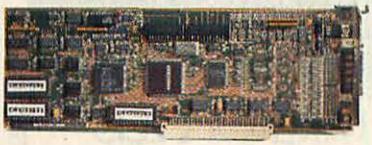
SPIN OPTICAL DRIVES

The 3.5" Olympus magneto-optical gives you 230 MB of capacity at hard drive speed! The NEC 5.25" magneto optical drive allows you to use ISO standard 650 MB or 1.3 GB media, compatible with the popular SONY standard. Sporting a 1 MB buffer and 30 ms. average seek, the NEC defines 5.25" optical performance.

Olympus 230 MB 3.5" 30 ms. **$899.00**
NEC 1.3 GB half-height 5.25" **$1999.00**



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MAKE YOUR SCSI BUS SCREAM.

You want to enjoy the benefits of PhotoShop and digital AV applications, but your old NuBus Mac is not up to the task. SuperBus lets you take advantage of today's high-speed hard drives, eliminating the SCSI limitations of older Macs. This fast SCSI-2 Busmaster card uses state-of-the-art ASIC technology to support transfer rates up to 10 MB per second. It also provides a high-speed channel for striping applications (RAID Level 0). Turn that old Mac CI into a graphics power-house, and experience up to a 100% increase in throughput by adding SuperBus with an external hard drive.*

**Depends on system configuration, model of hard drive, and application.*

SuperBus w/drive purchase **$299.00**
SuperBus and RAIDLine w/drive purchase **$399.00**
SuperBus and RAIDLine no drive purchase **$499.00**

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- Lifetime technical support.
- 24 Hour turnaround, 1 year replacement policy.
- Friendly, helpful staff. We appreciate your business!

MICROPOLIS

5 Yr warranty. Add $60 for External.

Size	Speed	RPM	Model	Internal
1052MB	8.5ms	5400	MC4110	$570
1750MB	10ms	5400	MC2217	$889
2050MB	8.5ms	5400	MC4221	$1349
3020MB	11ms	5400	MC1936	$1659
4294MB	8.5ms	7200	MC3243	$2179
9100MB	12ms	5400	MC1991	$3279
Audio / Visual Drives				
1052MB	8.5ms	5400	MC4110AV	$635
1750MB	10ms	5400	MC2217AV	$969
2050MB	8.5ms	5400	MC4221AV	$1349
3020MB	11ms	5400	MC1936AV	$1699
4294MB	8.5ms	7200	MC3243AV	$2279
9100MB	12ms	5400	MC1991AV	$3429

ATTENTION: POWER MAC OWNERS

Power HD™

- Drives from 270MB to 4Gig that are specifically configured for *Power Mac* operation.
- Includes *Power Mac* Native Hard Disk ToolKit software.
- NOW AVAILABLE! New 6100 ZFP model features a case that fits perfectly under your *Power Mac 6100*. Holds up to 4 drives.
- Call for up to the minute pricing.

OPTICAL DRIVE SALE!

- Includes cables, and 1 free disk.
- Smart Storage Solutions drives feature toll free support & mechanism made by IBM.
- Media price is for 10+ or w/ drive purchase.

Capacity	Brand	External	Media
128MB	Smart Storage	$689	$27
230MB	Smart Storage	$849	$36
230MB	Fujitsu	$879	$36
1.3Gig	Smart Storage	$1969	$84
1.3Gig	Hewlett Packard	$2289	$84
1.3Gig	Maxoptix	$2339	$84

2.5" Powerbook Drives

Size	Speed	RPM	Brand	Price
240MB	14ms	4500	Fujitsu	$270
256MB	17ms	4500	Quantum	$272
514MB	17ms	4500	Quantum	$442

Quantum™

#1 HARD DRIVE FOR MAC!

MegaHaus is your #1 source for Quantum drives.
- Low price guarantee on all Quantum drives!
- Same day shipping on most orders!

Capacity	Speed	RPM	Buffer	Wty	Model	Internal	External
170MB	17ms	3600	32K	2yr	ELS170S	$169	$229
270MB	12ms	4500	128K	2yr	LPS270S	$188	$248
340MB	12ms	4500	128K	2yr	LPS340S	$209	$269
365MB	11ms	4500	128K	2yr	LT365S	$219	$279
540MB	14ms	3600	128K	2yr	MV540S	$248	$308
541MB	11ms	4500	128K	2yr	LT540S	$263	$323
731MB	11ms	4500	128K	2yr	LT730S	$335	$395
1080MB	9.5ms	5400	512K	5yr	EMP1080S	$579	$639
1440MB	9.5ms	5400	512K	5yr	EMP1440S	$715	$775
2140MB	8.6ms	7200	512K	5yr	GP2140S	$1269	$1369
2160MB	9.5ms	5400	512K	5yr	EMP2160S	$1029	$1089
4280MB	8.6ms	7200	512K	5yr	GP4280S	$2399	$2499

SyQuest®

MegaHaus is your #1 source for Syquest drives.
- Low price guarantee on all Syquest drives!
- 1 FREE cartridge with each drive!
- 2 year warranty on drive and case!
- 5 year warranty on all cartridges!
- Same day shipping on most orders!

Genuine Syquest Media	5-9	10+
44MB	$61	$57
88MB	$66	$64
105MB	$54	$53
200MB	$77	$75
270MB	$62	$59

Capacity	Speed	Compatible	Model	Buffer	Internal	External
88MB	20ms	44, 88MB	SQ5110C	32K	$309	$359
105MB	14.5ms	105MB	SQ3105S	64K	$259	$309
200MB	18ms	44,88,200MB	SQ5200C	64K	$449	$489
270MB	13.5ms	105, 270MB	SQ3270S	128K	$429	$489

FUJITSU

- Low price guarantee on all Fujitsu drives!

Capacity	Speed	RPM	Buffer	Wty	Model	Internal	External
530MB	13.8ms	4500	256K	2yr	M2684S	$245	$305
1080MB	9.5ms	5400	256K	5yr	M2694S	$535	$595 BEST BUY!

HARD DRIVES

Capacity	Speed	RPM	Buffer	Brand	Warranty	Internal	External
720MB	12ms	4500	192K	IBM	2 Years	$415	$475
2040MB	9.2ms	5400	512K	IBM	5 Years	$1179	$1239
2145MB	8ms	7200	1024K	Seagate	5 Years	$1225	$1325 BEST BUY!
2148MB	9ms	5400	512K	Seagate	5 Years	$1099	$1159
4250MB	11ms	5400	1024K	IBM	5 Years	$2239	$2339
4290MB	8ms	7200	1024K	Seagate	5 Years	$2399	$2499
9080MB	11ms	5400	1024K	Seagate	5 Years	$3399	$3499

Many others available. Includes 4.3 compatible software driver & cables. We stock multiple bay enclosures for custom configurations.

CD ROM DRIVES

Brand	Model	Speed	Transfer	Buffer		Internal	External
Sanyo	SH93R	280ms	330KB/sec	256K		$149	$209
Toshiba	XM3401	200ms	330KB/sec	256K		$269	$329
Toshiba	XM3501	120ms	600KB/sec	256K		$379	$439 BEST BUY!
Pioneer	DRM602X	300ms	307KB/sec	256K	6 Disc CD Changer	$489	
Pioneer	DRM604X	300ms	612KB/sec	256K	6 Disc CD Changer	$1029	
Pionner	DRM1804X	300ms	612KB/sec	256K	18 Disc CD Changer	$1979	

Includes driver software with music play, $25 Photo CD processing coupon, and cables. Multi Drive CD Towers in stock

TAPE DRIVES

Capacity	Type	Brand	External	Capacity	Type	Brand	External
250MB	QIC 150	Archive	$499	4-8Gig	DDS DAT	Conner	$999
.75-1.5Gig	MiniCart	Exabyte	$649	4-8Gig	DDS DAT	HP	$1049
2-4Gig	MiniCart	Conner	$719 BEST BUY!	4-10Gig	DDS2 DAT	Sony	$1119
2Gig	DAT	Conner	$859	4-10Gig	DDS2 DAT	Conner	$1129
2Gig	DAT	HP	$959	4-10Gig	DDS2 DAT	HP	$1259

Includes Retrospect 2.1, 1 tape, and cables. OPTIMA DeskTape Software mounts DAT on desktop $275.

MEGAHAUS HARD DRIVES

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Fax (713) 333-3024
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- 24-hour approvals with flexible lease terms
- 100% tax deductible monthly payments
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PowerPC 8100 Super Station — $10,499

- PowerPC 8100/80 w/ 80Mhz PPC 601 CPU
- 72MB RAM, 540MB hard drive, extended keyboard
- Dual spin CD ROM drive
- SuperMac 20, 24-bit color monitor
- SuperMac Thunder 24, 1152 x 870 video card
- Image processing multifunctional drive: 650MB optical and SyQuest 88c in one enclosure

Zero Down! $68 per week — $9 a day!!

PowerPC 7100 Value Station — $8999

- PowerPC 7100/66 w/ 66Mhz PPC 601 CPU
- 72mb RAM, 540MB hard drive, extended keyboard
- Dual spin CD ROM drive
- SuperMac 17, 24-bit color monitor
- SuperMac Thunder 24, 1152 x 870 video card
- Image processing multifunctional drive: 650MB optical and SyQuest 88c in one enclosure

Zero Down! $60 per week — $8 a day!!

PowerPC 6100 Imaging Station — $8399

- PowerPC 6100/60 w/ 60Mhz PPC 601 CPU
- 40MB RAM, 540MB HD, extended keyboard
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- SuperMac Thunder 24, 1152 x 870 video card
- External SyQuest 200MB with cartridge
- Archive 2.0GB tape backup system
- TI Pro 600, 9 ppm, 600 dpi laser printer
- AVision 680AV, 6400 x 6400 dpi scanner w/PS LE

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Video Production Workstation — $20,299

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Scanner	Price
AV600, 4800x4800 dpi w/ Adobe Photoshop LE	**$569** SALE
AV600, 4800x4800 dpi w/ full Adobe Photoshop	$779
AV680, 6400x6400 dpi w/ Adobe Photoshop LE	$679
AV680, 6400x6400 dpi w/ full Adobe Photoshop	$879
AVision transparency adapter	$299

Tape Drives

Sony DAT drives are specifically designed for high capacity data backup, distribution and archival mass storage. With its built-in data compression capabilities, the Sony SDT-5000 can hold up to 16GB of files on a single 120 meter cartridge.

Model	Capacity	Size	MacKit
Sony SDT-2000	2GB	3.5"HH	$785
Sony SDT-5000	**5-16GB**	**3.5"HH**	**$1185** SALE
Exabyte 8200	2GB	5.25"FH	$1275
Exabyte 8500	5GB	5.25"FH	$2175
Exabyte 8205	2-5GB	5.25"HH	$1585
Exabyte 8505	5-10GB	5.25"HH	$2255

Includes external drive, 25/50 SCSI Cable, MAC SW II and terminator. Retrospect add $75

Multifunctional Drives

A multifunctional drive is a custom-made combination of hard drive, optical drive, CD-ROM, tape or Syquest drive mounted in the same enclosure. Multifunctional drives require less space, eliminate compatibility problems and cost less than separate components.

Multifunctional	Price
SyQuest 200 /540MB hard drive	$759
SyQuest 88c /650MB optical drive	$2059
SyQuest 88c /NEC 3X CD ROM /540MB HD	$1149
128MB optical drive /540MB hard drive	$979
NEC 3X CD-ROM /1.3GB optical drive	**$2449** SALE
2.1GB Quantum HD /8.0GB Sony DAT drive	**$2099** SALE
4.0GB Seagate HD /Nikon CoolScan	$3029

Includes drive, 25/50 SCSI cable, terminator and Mac software.

Systems

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8100 24/1.0/CD	SuperMac 20/Thunder 24	$7599	$6.55/day
8100 40/1.7/CD	SuperMac 20/Thunder 24	$8199	$6.88/day
7100 8/540/CD	SuperMac 17	$4129	$3.58/day
7100 24/540/CD	SuperMac 20/Thunder 24	$6089	$5.39/day
6100 24/540	**14" hi-res monitor**	**$2939**	**$2.59/day** SALE
Q950 24/540	SuperMac 20/Thunder 24	$5939	$5.23/day
Q800 24/540/CD	SuperMac 17	$4129	$3.58/day
Q800 32/1.0/CD	SuperMac 20/Thunder 24	$6199	$5.56/day
Q660AV 16/540	**14" hi-res monitor**	**$2269**	**$1.93/day** SALE

SyQuest Drives

Model	Internal	External
SyQuest 270	$382	$422
SyQuest 200	**$367**	**$407** SALE
SyQuest 105	$199	$239
SyQuest 88C	$260	$300
SyQuest 44	$130	$160

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Cartridges	44MB cartridges only $44
270MB Cartridges *(20 + or with drive purchase)*	$61
200MB Cartridges *(20 + or with drive purchase)*	$77
105MB Cartridges *(20 + or with drive purchase)*	$51
88MB Cartridges *(20 + or with drive purchase)*	$55/63
44MB Cartridges *(20 + or with drive purchase)*	$44/55

Hard Drives

Fujitsu 1.2GB only $595

Capacity	Description	Internal	External
1200MB	3.5" HH 9ms	$595	$655 SALE

Quantum 540MB only $395

Capacity	Description	Internal	External
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GO514MB	**2.5" NB 17ms**	**$485**	**$585** SALE
42 MB	3.5" LP 17ms	$109	$169
85MB	3.5" LP 17ms	$130	$190
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270MB	3.5" LP 10ms	$195	$255
340MB	3.5" LP 10ms	$225	$285
540MB	**3.5" LP 10ms**	**$275**	**$335** SALE
1000MB	3.5" HH 10ms	$625	$685
1400MB	3.5" HH 9.5ms	$815	$875
2100MB	3.5" HH 9.5ms	$1135	$1195

Seagate Hawk 1 only $1150

Capacity	Description	Internal	External
2100MB	B'cuda 2, 8ms, 3.5"	$1335	$1395
4300MB	**B'cuda 4, 8ms, 3.5"**	**$2465**	**$2525** SALE
1000MB	Hawk, 9ms, 3.5"	$569	$629
1700MB	**Hawk 1, 9ms, 3.5"**	**$1150**	**$1210** SALE
2100MB	Hawk 2, 9ms, 3.5"	$1145	$1205
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9100MB	Elite 9, llms, 5.25"	$3735	$3835

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5.25" Optical Drives dsc 650MB $1199

Model	Capacity	Seek	MacKit
IBM 650	**594/650MB**	**40ms**	**$1199** SALE
Ricoh-9200 EX	594/650MB	35ms	$1849
MaxOptix-Tahiti II	**594/1GB**	**25ms**	**$1899** SALE
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Sony-650	594/650	19*ms	$1899
PMO-1.3GB	650/1.3GB	19*ms	$2799
Sony 1.3GB	650/1.3GB	25ms	$2299

3.5" Optical Drives Panasonic 128MB $689

Model	Capacity	Seek	MacKit
Panasonic	**128mb**	**35ms**	**$689** SALE
Fujitsu-230	230mb	30ms	$899
Sony P-301	128mb	35ms	$999
Most-256	128/256mb	37ms	$895

Includes external drive, 25/50 SCSI cable, Mac SW & terminator.

5.25" Cartridges	Price
dsc / 3M 650MB	$79 /99
Sony 650/1.3GB	$119 /139
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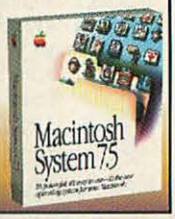

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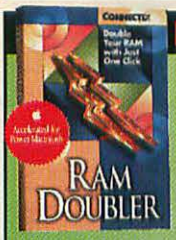

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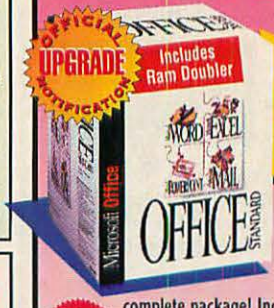

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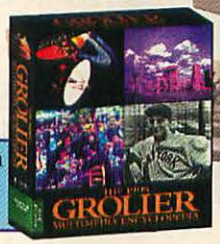

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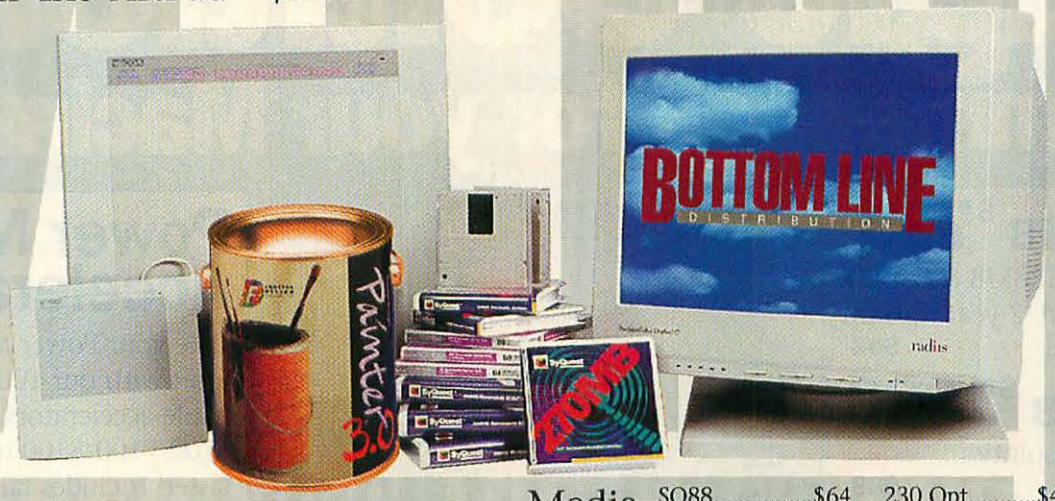

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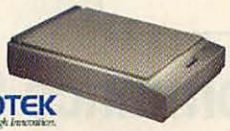

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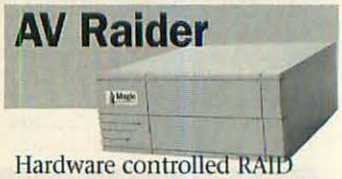

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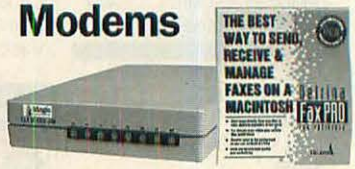

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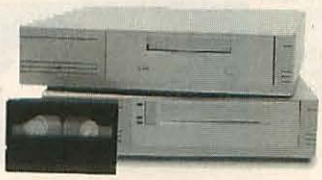

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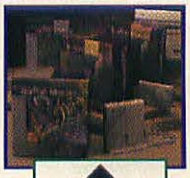

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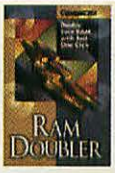

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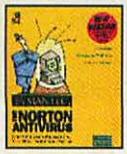

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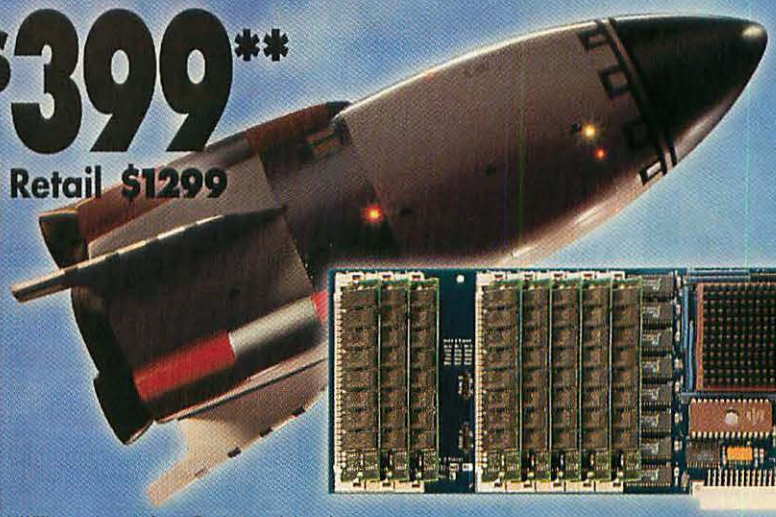

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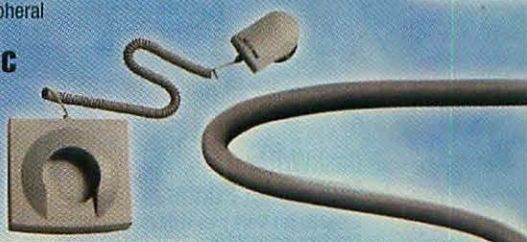

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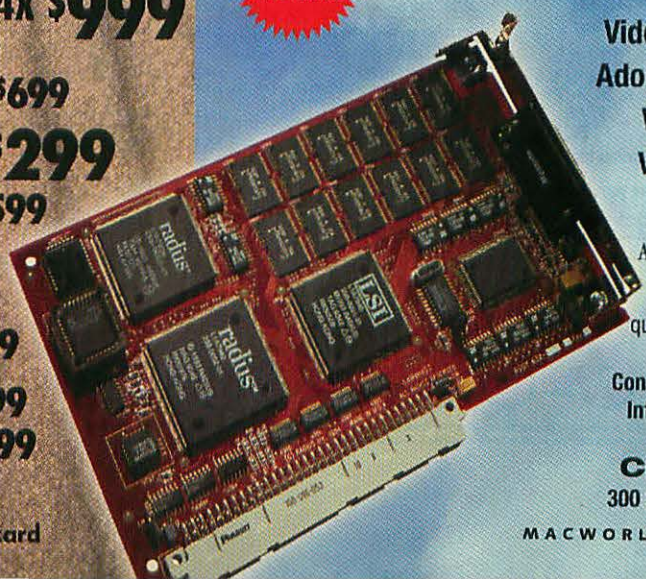

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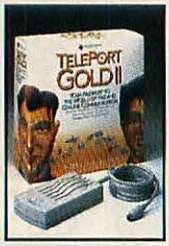

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HP DeskWriter 1200C 600 x 300 dpi,3 pages per minute,Color,3 yr. warranty	2214
HP LaserJet 4ML Printer 300 x 300 dpi,4 pages per minute,3 yr. warranty	1027
HP LaserJet 4MP Printer 600 x 600 dpi,4 pages per minute,3 yr. warranty	1367
HP LaserJet 4M Plus Printer 600 x 600 dpi,12 pages per minute,3 yr. warranty	2120

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Capacity	Model	Size	Access	Price
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540MB	D3717	3.5"	12ms	$260

NEC drives include a 2 year warranty

MICROPOLIS

1.2GB	2210	3.5"	10ms	$575
1.7GB	2217	3.5"	10ms	$895

Micropolis drives include a 5 year(Hot Swap) warranty

Seagate

214 MB	ST3243	3.5"	15ms	$165
260 MB	ST3290A	3.5"	15ms	$180
340 MB	ST3391A	3.5"	12ms	$205
420 MB	ST3491A	3.5"	12ms	$225
540 MB	ST5660A	3.5"	12ms	$295

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Zero Footprint	$75
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Hard Drives

Quantum Quantum Quantum

LPS,Pro,Lightening,Maverick,Empire,Grand Prix

Capacity	Size	Access	RPM	Cache	Int.	Ext.
170 MB	3.5"	11 ms	4500	128K	$165	$225
270 MB	3.5"	11 ms	4500	128K	185	245
365 MB	3.5"	11 ms	4500	128K	220	280
540 MB	3.5"	12 ms	4500	128K	250	310
730 MB	3.5"	11 ms	4500	512K	350	420
1080 MB	3.5"	10ms	5400	512K	595	655
1440 MB	3.5"	9.5 ms	5400	512K	755	815
2100 MB	3.5"	9.5 ms	5400	512K	1055	1115
4200 MB	3.5"	8.6 ms	7200	512K	Call	Call

LPS,Maverick,Lightening, and Pro drives include a 2 year factory warranty.
Empire & Grand Prix drives include a 5 year factory warranty.

Daytona Series Powerbook Drives

Capacity	Size	Seek	Warranty	Int.	Ext.
256 MB	2.5"	17ms	1 Year	280	380
514 MB	2.5"	14ms	1 Year	465	565

Quantum Powerbook drives include a 2 year factory warranty.

MICROPOLIS MICROPOLIS

Capacity	Size	Model	Access	RPM	Cache	Int.	Ext.
1.2 GB	3.5"	M4110	8 ms	5400	512K	$575	$635
1.7 GB	3.5"	M2217	10 ms	5400	512K	895	955
2.1 GB	3.5"	M4200	8.5 ms	7200	512K	Call	Call
3.6 GB	5.25"	M1936	11 ms	5400	256K	1875	1975
4.3 GB	3.5"	M3243	8.5 ms	7200	512K	2345	2405
9.0 GB	5.25"	M1991	12 ms	5400	512K	3495	3595

Direct to Disk Recording AV Drives

1.2 GB	3.5"	M4110AV	10 ms	5400	512K	$625	$685
1.7 GB	3.5"	M2217AV	10 ms	5400	512K	945	1005
3.6 GB	5.25"	M1936AV	11 ms	5400	512K	1925	2025

Micropolis drives include a 5 Year (HOT SWAP) Warranty.

Seagate Seagate Seagate Seagate

Capacity	Size	Model	Access	RPM	Cache	Int	Ext
1.2 GB	3.5"	ST31200N	10ms	5400	256K	$595	$655
1.9 GB	3.5"	Hawk 2	9ms	5400	512K	1195	1255
4.2 GB	3.5"	Hawk 4	9ms	5400	512K	2120	2180
2.4 GB	*3.5"*	*Barracuda 2*	*8ms*	*7200*	*1024K*	*1275*	*1335*
4.2 GB	3.5"	Barracuda 4	8ms	7200	1024K	Call	Call
3.4 GB	5.25"	ST 43400N	10ms	5400	512K	1970	2070
9 GB	5.25"	ST 410800N	11ms	5400	512K	Call	Call

All Seagate drives include a 5 year factory warranty.

IBM IBM IBM IBM IBM IBM IBM IBM

Capacity	Model	Access	RPM	Warranty	Int.	Ext
270 MB	94G2644	12 ms	4500	2 Year	$180	$240
364 MB	94G2645	12 ms	4500	2 Year	210	270
540 MB	94G2646	12 ms	4500	2 Year	265	325
720 MB	94G2647	12 ms	4500	2 Year	360	420
1.0 GB	70G8492	11 ms	5400	5 Year	595	655
2.0 GB	70G8493	9 ms	5400	5 Year	1150	1210

HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD

Capacity	Model	Access	RPM	Warranty	Int.	Ext.
1.2 GB	C3323	9.5 ms	5400	5 Year	$675	$735
2.4 GB	C2490	8.5 ms	6400	5 Year	1150	1210

NEC NEC NEC NEC NEC NEC NEC NEC

Capacity	Model	Access	RPM	Warranty	Int.	Ext.
540 MB	D3817	12 ms	5400	2 Year	$275	$335

All drives are tested and formatted with the latest SCSI manager 4.3 compatible software which is 100% PowerMac Compatible. External drives come complete with external termination and your choice of a double shielded 25/50 system cable or 50/50

SyQuest SyQuest SyQuest

Capacity	Model	Seek	RPM	Buffer	Int.	Ext.
88 MB	SQ5110C	20ms	3200	32K	305	365
105 MB	SQ3105	14.5ms	3600	64K	245	305
200 MB	SQ5200	18 ms	3200	64K	425	485
270 MB	SQ3270	13.5ms	3200	128K	425	485

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SyQuest Media

Capacity	Model	Warranty	Price
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NEC CD -ROM drives include a two year warranty.

Optical Drives

HEWLETT PACKARD

Capacity	Model	Access	RPM	Warranty	Int.	Ext.
1.3 GB	C1716T	23.5ms	2400	1 Year	$2350	$2395

FUJITSU DynaMO

Capacity	Model	Access	RPM	Warranty	Int.	Ext.
230 MB	DynaMo	30ms	3600	2 Year	N/A	$965

NEC NEW!!!

Capacity	Model	Transfer	RPM	Warranty	Int.	Ext.
1.3 GB	ODD-155	3.5MB/sec.	3000	5 Year	$2020	$2080

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Capacity	Model	Transfer Rate	Media	Int.	Ext.
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4-10 GB	1533A	60 MB/min.	4mm	1315	1365
20-50 GB	1553A Auto Tape Loader	60 MB/min.	4mm	3495	3595

Exabyte

Capacity	Model	Transfer Rate	Media	Int.	Ext.
2-5 GB	8205	263 KB/sec.	8mm	$1485	$1535
5-10 GB	8505	500 KB/sec.	8mm	2175	2275
20-50 GB	10i Auto Tape Loader	1 MB/sec.	8mm	CALL	CALL

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7100/66, 8-250	$2495	$75
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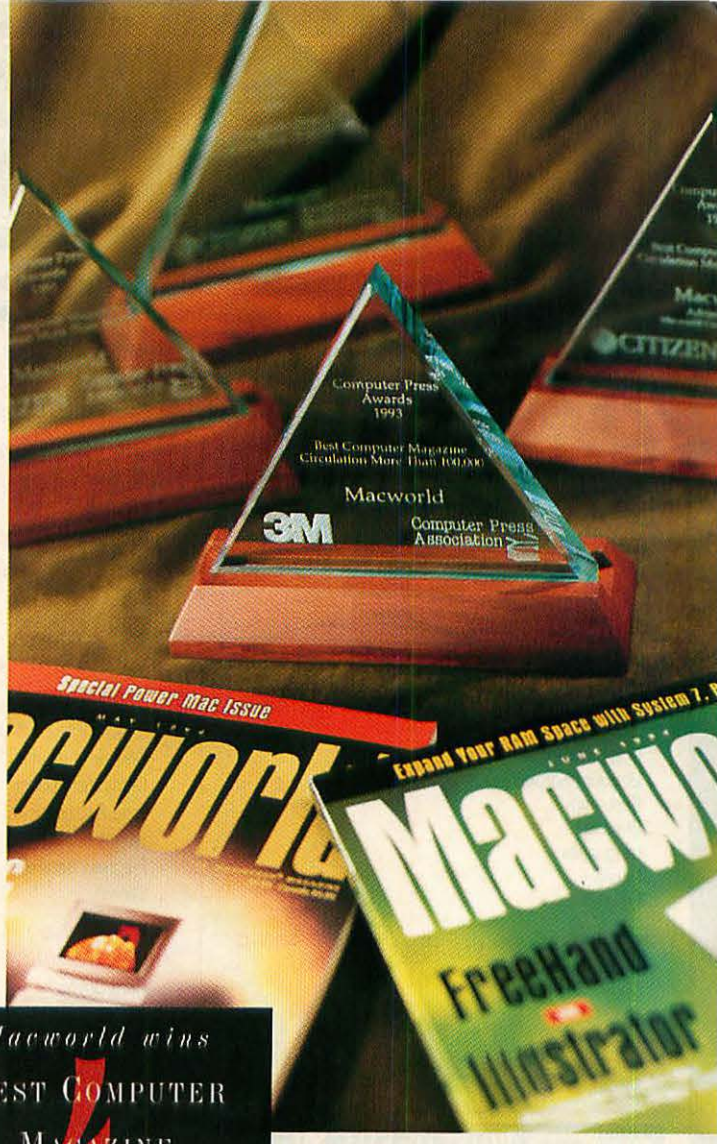

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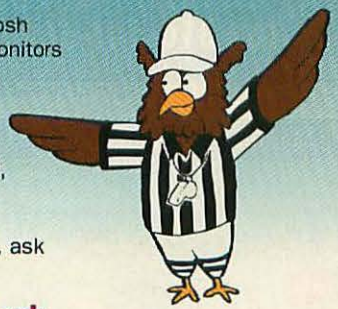

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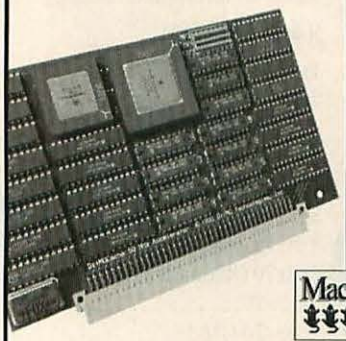

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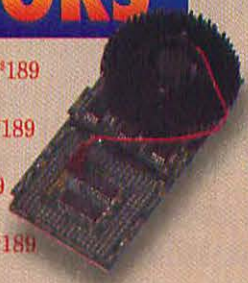

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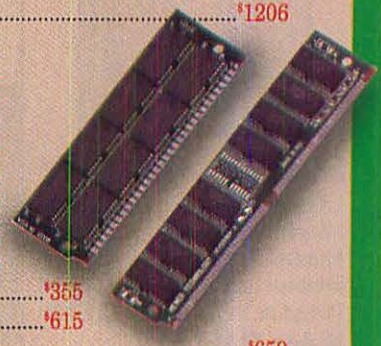

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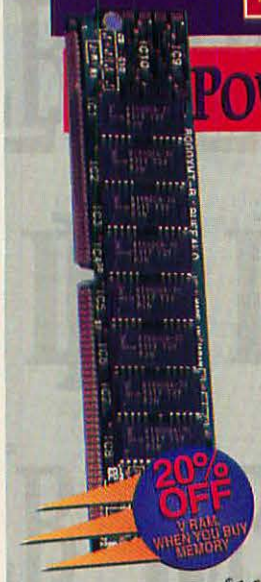

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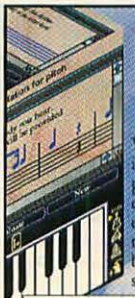

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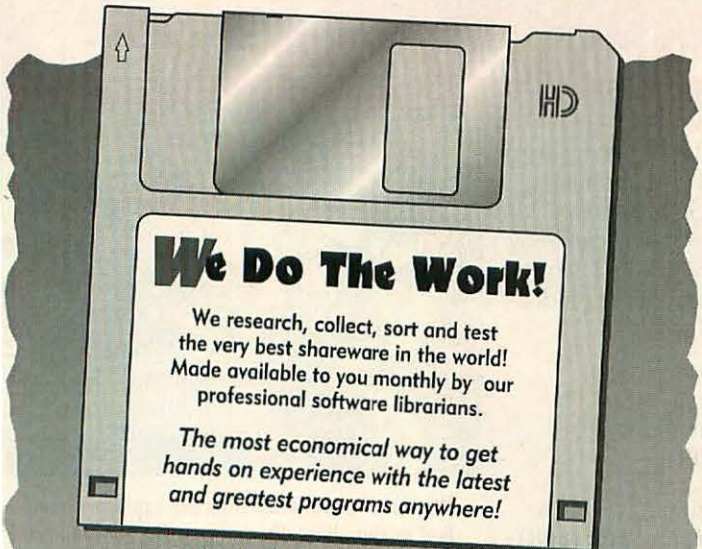

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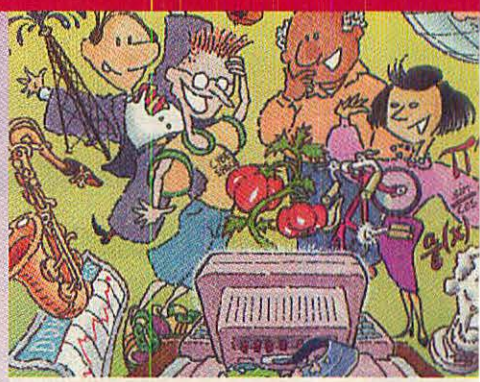

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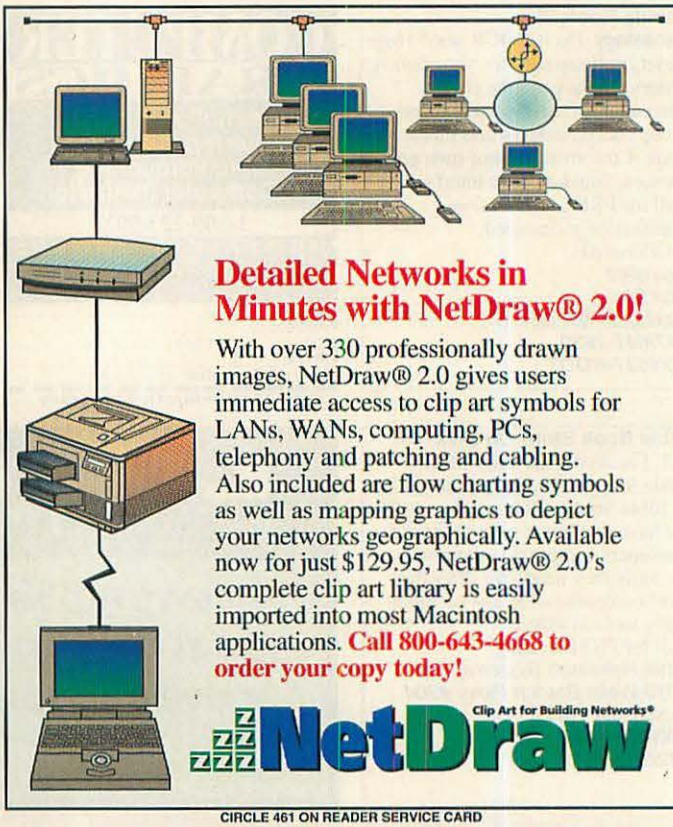

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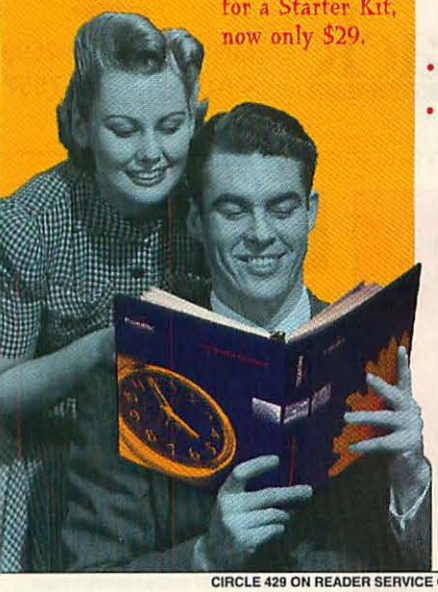

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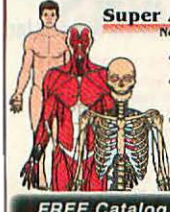

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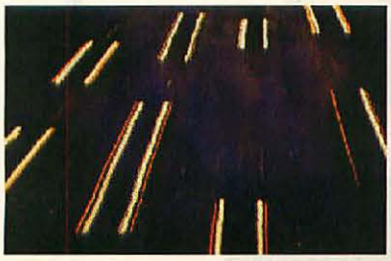
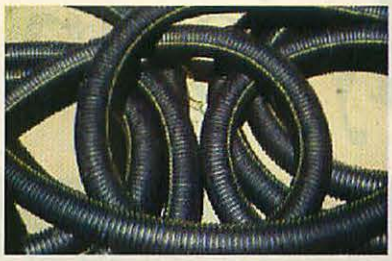


It's too dangerous



It's too confusing

It's too big

Internet Fact:

Internet access for teachers and students is finally safe and affordable—with *the*LINQ

*the*LINQ is the new Learning and Instruction Network from Quality Computers. And thanks to *the*LINQ, the Internet is safe, organized, and brought down to size. That's because *the*LINQ is a monitored Internet service created specifically for education.

Unlike the Internet at large, you won't find obscene or pornographic material on *the*LINQ. Nor will you find games or other non-educational material. We collect only the best of the Internet (screening out inappropriate information), cross-reference it for easy access, and deliver it directly to your classroom. Now even students can access the Internet without danger.

And *the*LINQ is affordable. There are no per-minute charges or hourly limits. That's because *the*LINQ server you and your students use is actually in your school, not halfway across the country. Everyone can access *the*LINQ from any computer on your local area network—as much as they want—even from their home computer, with a modem. Your school pays a single subscription fee that covers everyone in the building, no matter how much the service is used.

*the*LINQ is an out-of-the-box solution that gives your school the Internet services you've asked for:

- **Internet E-Mail** for teachers, students, administrators, parents, and even residents of your community
- **Free software** collected from the Internet's vast resources
- **Educational forums** where you can discuss topics ranging from local topics (fund raising, school news, etc.) to global affairs (multi-cultural education, the environment, etc.)
- **Global projects** that involve classes all over the world in research and discovery
- **And much more,** including demonstration versions of today's hottest software, online reference materials, and support forums from top software publishers.

Imagine the possibilities when teachers, students, and parents can openly share and harness our most valuable resources—our creativity and our ability to learn. And not just within your community, but around the world through the Internet. It's true global education, and *the*LINQ brings it to *your* classroom. *For more information, call Quality Computers for your free LINQ information kit, demo disk, and video, and read the other ads in this issue of Macworld.*

Someday is now

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With *the*LINQ nobody is an island

There's a way for students and teachers to communicate across the school or around the world today—*the*LINQ

What's this Internet thing all about anyway? If it could be summed up in one word, it would be COMMUNICATION. People are brought together when they communicate. People learn when they communicate.

With *the*LINQ, you get communication. *the*LINQ provides a safe, organized, easy-to-use connection to the Internet.

Just imagine being able to consult fellow teachers from all over the country about ways to reach a troubled student; or being able to let your students share their ideas with students from another country. You'd find that you're no longer an island, but that you and your students have a network of friends—on *the*LINQ.

The possibilities are endless. Your students could share their stories and poems with students in Japan. Children in New York City could learn how children in Hawaii live—and vice versa—by communicating directly with them. What music do you like? What sports do you play? What's your climate like? What's your favorite food? Just imagine the questions they'd ask. Imagine what they'd learn.

You've heard of the vast reference resources available on the Internet. With *the*LINQ, you and your students don't have to hunt for them, *the*LINQ brings them directly to you. How would you like to have access to some of the most prestigious university libraries in America? Or a collection of interactive reference works? It's possible now, with *the*LINQ.

For more information, call Quality Computers for your free LINQ information kit, demo disk, and video, and read the other ads in this issue of Macworld.

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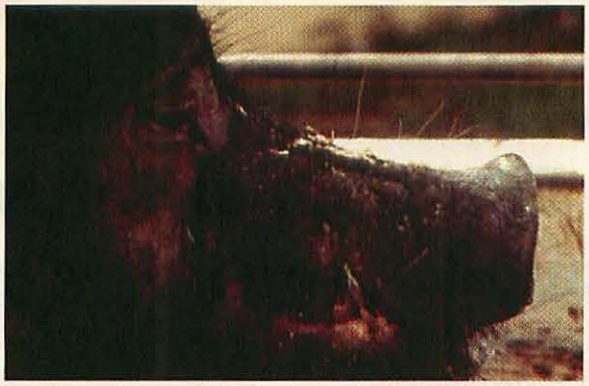
Compared to *the*LINQ other Internet services don't look so good.



There's a way to connect to the Internet that breaks the mold of traditional "dial-in" services—*the*LINQ

*the*LINQ stands for Learning and Information Network from Quality Computers. What it does is take you where you want to go on the Internet. How it does it will make the way you access bulletin boards now seem old fashioned.

Think of how you and your students have to get to any on-line service now. Everyone has to have an account number. Everyone has to dial. You get billed for every minute that someone is logged on.

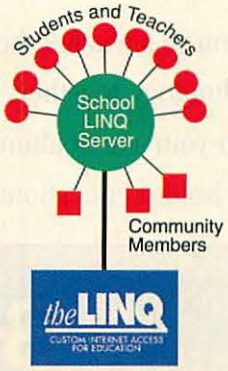
*the*LINQ is different. Your LINQ server stays connected to *the*LINQ service 24-hours a day. Anyone in your school can log onto your LINQ server any time they want with any computer on your network. No account number needed! Your LINQ server is automatically updated every night so in the morning, you have the latest *the*LINQ has to offer.

*the*LINQ gives you the Internet you want without all the other junk. E-Mail, free software, educational forums, software demos, on-line reference works, and access to other commercial services at discount rates are all part of *the*LINQ.

And unlike the Internet at large, *the*LINQ is safe. You don't have to worry about your students meeting an on-line predator. Everything we put on *the*LINQ is screened and reviewed.

For more information, call Quality Computers for your free LINQ information kit, demo disk, and video.

Traditional online services require that everyone using the service has a separate account and pays by the minute.



With LINQ, everyone in your school gets Internet access. Even people in your community can log on!

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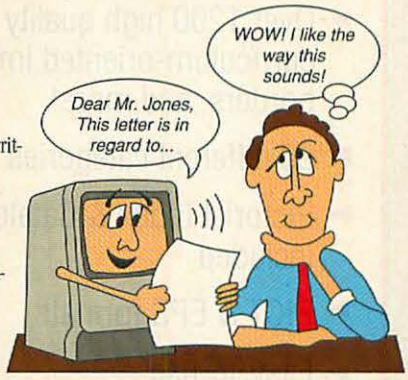

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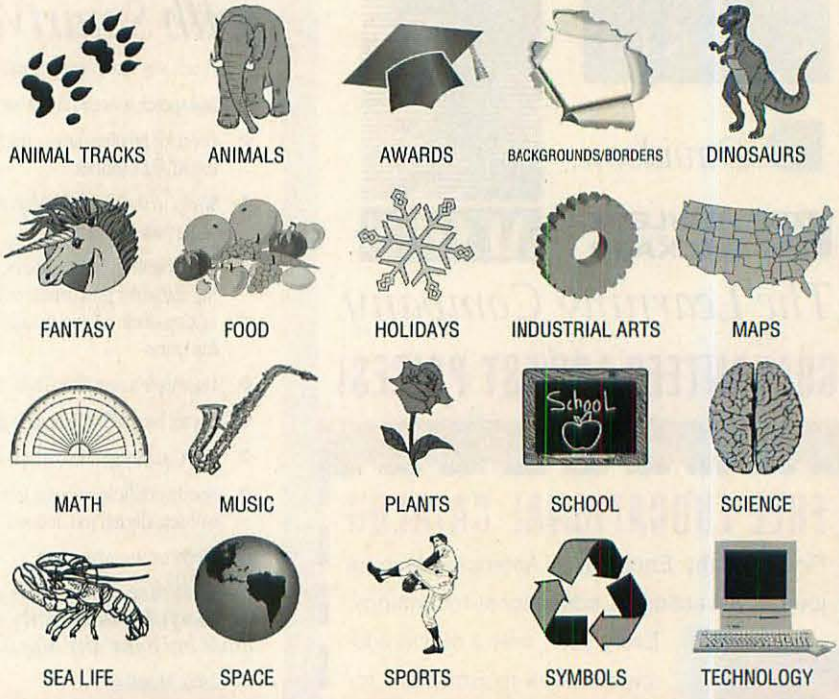

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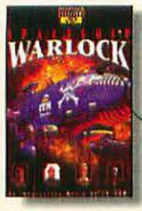

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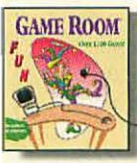

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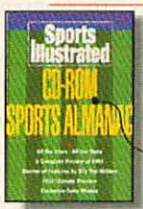

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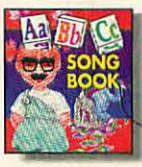

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WISE GUY

BY GUY KAWASAKI

Objective Investing

Oy vey and mea culpa: a column that cost Guy money

A FEW MONTHS AGO OBJECTIVE Software disappeared from the list of conflicts of interest in my byline (see below). It's not because I cashed out. It's because Objective is gone, kaput, aloha oe.

The Product

Objective Software's product was called SpreadBase. Its goal was to combine the functionality, as you might guess, of a spreadsheet and a database. The concept was that a spreadsheet was a good and well-understood method for manipulating and viewing data. A database, in addition, was a good and well-understood method for holding large amounts of information.

Combining both, however, turned out to be not so good and not so well understood. SpreadBase was caught in the hand-waving zone of a "new category of software." (When you hear that a product creates a new category of software, it means the product is too slow and too incomplete to compete in existing categories.)

The Lessons

Whatever you call my Objective investing, I call it an expensive education. My only solace is that the failure of Objective has provided column fodder. Here's what I've learned from the whole fiasco.

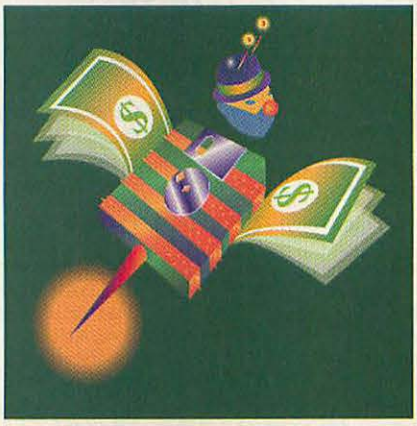
Lesson 1: Never invest in a product you wouldn't use. The warning bells should have gone off at the very start, because no matter how good SpreadBase was, I would never use it. I'm simply not a spreadsheet and a database kind of guy. I don't have to model or forecast anything, and I don't need to store massive amounts of data.

I invested in a product I wouldn't use for two reasons: one stupid, the other stupider. The stupid reason is that I convinced myself (albeit with Objective's help) that there was a market that needed to manipulate and display database-type data with spreadsheet-type tools. There wasn't such a market.

The stupider reason is that I love to take on Microsoft. This yields another lesson: Invest to make money. Invest to make customers happy. But never invest to do someone in.

Lesson 2: The hard part of introducing a new product is "crossing the chasm." A few months after losing all my money, I came across a book called *Crossing the Chasm*, by Geoffrey Moore (HarperCollins, 1991). The book's message is that early adopters like anything new and are willing to roll with the punches of a new product. However, early-adopter enthusiasm doth not a sale make.

This is because it's easy to get a few people inside a company excited about a new product: you treat them special, return their phone calls, and send them prerelease software. Even if your product is merely decent, they'll like it just because of the fawning attention.



Once you ship and your product doesn't work so well with 50,000 records, it's very hard to make inroads against a "standard."

Lesson 3: It's your money, so speak up when you don't believe something you hear. The executives of Objective stated over and over that beta sites liked the product so much that they would cut purchase orders before the product shipped. And—get this—they were going to price SpreadBase roughly three times higher than Excel "to communicate how much more powerful SpreadBase was than Excel."

I didn't believe this then and certainly not now. I should have protested at the top of my lungs, and if this failed, resigned from the board. But no, I was placated (bludgeoned, more accurately) when they told me, "Guy, you're used to selling $60 contact managers, file-compression software, and screen savers. You don't understand high-end users."

Silly me. With everyone else in the room nodding in agreement, I thought, "Guy, you're the stupid one. These fellows know better than you do. Go with the flow. Be a team player. No one said you've cornered the market on new-product introduction knowledge." At least I learned that there is a big difference between groupthink and team play.

Lesson 4: You invest in product, not just the people. I invested in Objective Software mostly because of my faith in several of the employees. My thinking was, "These folks are some of the most competent software people I know, so whatever product they create, it will be great."

In hindsight, I should have known that great people don't always create great software. There are other factors that can affect the product: (1) everyone else who works for the company might not be as great; (2) the past is not always a good indicator of the future; and (3) the role of luck and timing cannot be discounted.

This is not to say that you should get involved in a company with a great product made by people you despise or don't respect—I've done this too. A good investment requires both good people and a good product.

Get Back in the Saddle

There you have it: everything I learned for my money. May you never have the occasion to write a column like this. And by the way, if you've got a word processor that is cheaper and better than Word, I'm game. ■

GUY KAWASAKI's views are his own and only sporadically represent those of *Macworld*. He has investments in Bit Jugglers, Global Village Communication, Bookmaker Corporation, and others. He is president of Fog City Software. He can be reached at macway@aol.com.

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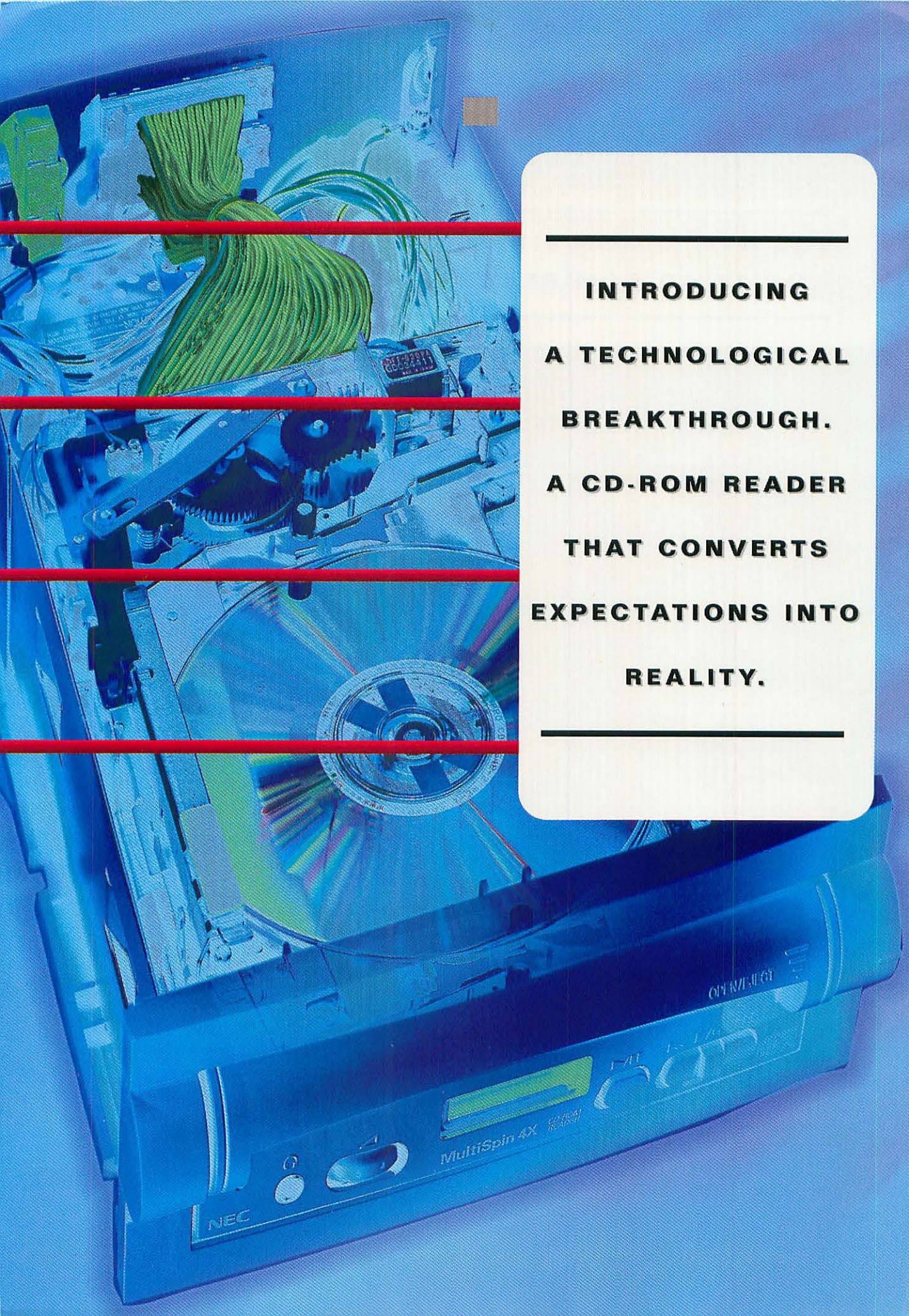
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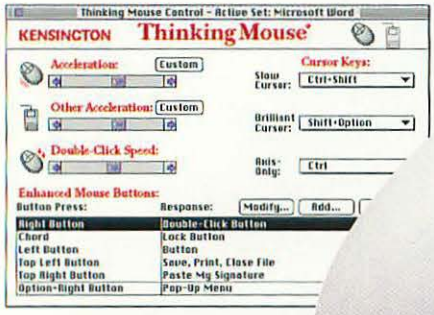
Introducing Thinking Mouse. The mouse designed for the way you work.

Unlike ordinary mice, Thinking Mouse is a *programmable* mouse. That means you can customize Thinking Mouse by assigning frequently used commands to different mouse buttons. And because each command executes with a single click, you work faster and save valuable time.



Thinking Mouse Control Panel

Create your own pop-up menu.

Want to save even more time?

Thinking Mouse lets you organize frequently used commands in a personalized pop-up menu.

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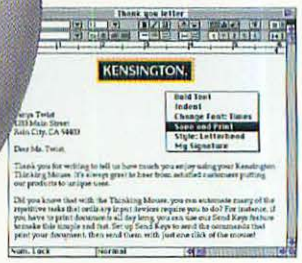
You can indent text, change fonts, even insert your signature into a document.



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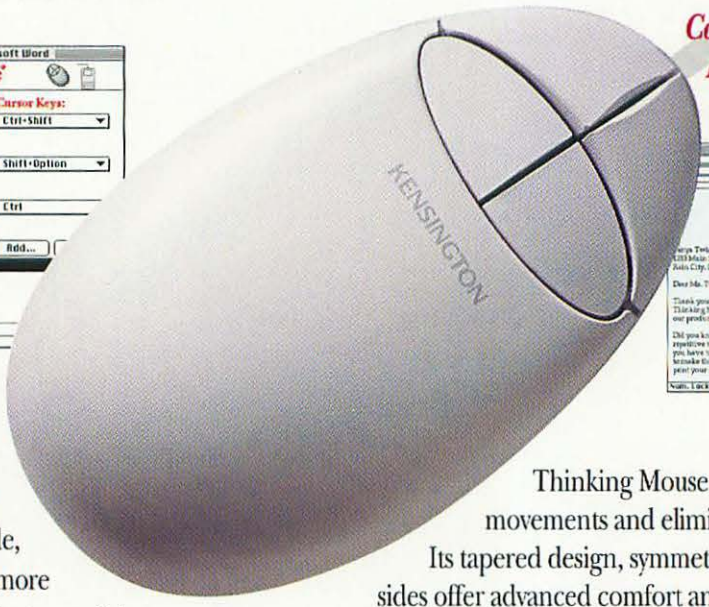

The way you program Thinking Mouse all depends on how you work. For example, you can open an application more easily by double-clicking with just one click. You can drag, scroll or highlight with less effort by locking a button down with just one click. You can even execute multi-step commands faster with a single click—like printing and saving a document, entering a block of text, logging onto a network, even sending a fax. The possibilities are endless.

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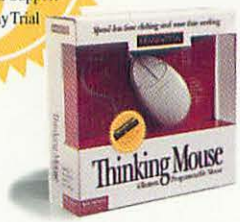

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